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OF THE
ENTOMOLOGICAL SOCIETY
OF
WASHINGTON.



Volume VI, No. 1.

JANUARY, 1904.

(Meetings of May 14, 1903, to December 3, 1903.)

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No. 4 (pp. 193-254), November 12, 1904.

Publication Committee for Volume VI.

ROLLA P. CURRIE,

HARRISON G. DYAR,

E. A. SCHWARZ,

L. O. HOWARD,

WM. H. ASHMEAD,

D. W. COQUILLET,

OTTO HEIDEMANN.

PROCEEDINGS
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OF WASHINGTON.

VOL. VI.

JANUARY, 1904.

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MAY 14, 1903.

The 178th regular meeting was held in the Sængerbund Hall, 314 C street, N.W., Dr. Howard in the chair, and Messrs. Ashmead, Benton, Busck, Currie, Doolittle, Dyar, Gill, Heidemann, Kotinsky, Morris, Schwarz, Simpson, Ulke and Warner, members, and Mr. H. Bolce, visitor, also present.

Mr. H. Bolce, of the Treasury Department, was elected an active member of the Society.

—Dr. Howard presented a note on a letter from Dr. Fletcher, wherein the latter reported black flies (*Simulium columbatcense* Schœnbauer) entering the anus and vulva of domestic animals.

—Mr. Ashmead exhibited drawings to illustrate his monograph of the North American Braconidæ, soon to be published by the National Museum, and accompanied the exhibition by remarks illustrating the characters of the various genera represented by these drawings. Among other things he said that in many instances he was led to detect generic and tribal characters by a knowledge of the habits of the insect. His notes were discussed by Messrs. Howard, Gill, Schwarz and Benton.

Dr. Howard stated that in November, 1891, he read a paper before the Association of Economic Entomologists at Champaign,

Illinois,* in which, in discussing the host relations of parasitic Hymenoptera, he advanced the idea that the classification of the group would undoubtedly be affected by a more accurate knowledge of host relations, and entered a plea for careful records. He was therefore greatly pleased to see from Mr. Ashmead's statements that the exact knowledge of habits, largely due to the work of Washington entomologists, had led Mr. Ashmead to discoveries affecting classification, thus justifying the 12-year-old prophecy. He referred especially to the new genus separated from *Bracon* to which Mr. Ashmead's attention had been called by the fact that all of the members were parasitic upon Cecidomyiidæ instead of upon beetles, as is the general rule with the genus *Bracon*.

Mr. Ashmead stated that he had discovered that the tribes of Cynipidæ which he had erected correspond exactly with the groups of plants on which they make their galls, such as *Quercus*, *Rosaceæ*, *Acacia*, etc.; and, on the other hand, from the nature of the host, he had been enabled to explain the differences in structure.

—Mr. Busck then read extracts from his paper on the generic name of the codling moth.†

The paper was discussed by Messrs. Schwarz, Simpson, Howard, Dyar and Gill.

—Dr. Dyar mentioned a peculiar Lepidopterous larva which had been seen by several members of the Society at Plummer's Island, Maryland. It occurs only in spring. Mr. Barber brought in some last May (May, 1902), and the first moth had just emerged (April, 1903). The plant is *Rhacelia dubia*, according to Mr. Morris; the larvæ live exposed on the plant and are brightly colored. The moth that emerged is not well developed and the color seems grayer than normal, but otherwise it agrees exactly with specimens of *Ethmia zelleriella* Chambers, from Texas. The following description of the larva was handed to the Secretary for publication:

* See *Insect Life*, III, No. 6, p. 277, March, 1891.

† Published in *Journ. N. Y. Ent. Soc.*, XI, No. 2, pp. 106-111, June, 1903

DESCRIPTION OF THE LARVA OF ETHMIA ZELLERIELLA CHAMBERS.

By HARRISON G. DYAR.

Head rounded, apex retracted, clypeus high; black; a greenish white mark in the upper half of the clypeus and a rounded spot on each side, separated only by the black suture; epistoma and basal antennal joint pale; width, 1.2 mm. Body cylindrical, normal, the ends very slightly tapering; segmental incisures distinct, weakly 2-annulate. Whitish opaque, a diffuse yellow dorsal band, the lateral region likewise yellowish shaded; no shields; joints 2 and 3 subdorsally blotched in smoky black, the marks joining dorsally on joint 3; joints 4-5 anteriorly banded in smoky, velvety black, solidly except for dorsal and lateral anterior notch on joint 4; smoky ventrally. A rounded dorsal black spot on the segments and a smaller one in the incisure; a broad dark gray subdorsal shade, diffuse above, sharp below, sending a thick arm across to each spiracle, obliquely, posteriorly; slight subventral gray spottings, heavier on joints 2 and 3; anal shield sooty. Tubercles in large, round, velvety black spots, i dorsad-anterior to ii, iv and v united, vii of three setæ on the anterior leg base on a pale ground; on thorax ia + ib, iia + iib, iv + v. Thoracic feet black; setæ long, black; abdominal feet slender, pale.

—Dr. Dyar presented also a description of the larva of *Litodonta hydromeli*. Mr. Schwarz had found the larva again, this time in Key West, Florida, and he brought home two examples, which have been nicely inflated for the collection by Mr. Caudell. They were feeding on *Bumelia angustifolia*.

DESCRIPTION OF THE LARVA OF LITODONTA HYDROMELI HARVEY.

By HARRISON G. DYAR.

Egg. Two-thirds spherical, the base flat; dull whitish green, uniform, obscurely but finely, neatly reticulate, the reticulations very slightly raised, hexagonal, with pores at the angles, looking like whitish dots, obscure; surface a little frosted. Diameter, 1 mm.; height, .65 mm.

Larva, stage V. The larvæ are sluggish, not moving when touched. They hold the tail elevated continually. Head higher than wide, slightly bilobed, flattened before, clypeus strongly constricted, reaching about one-third to the vertex; erect, apex higher than joint 2; median suture depressed near vertex; dark purplish, reticulate mottled with blackish, pinkish behind and in a spot reaching a distance down the angle of each

lobe; width, 2.8 mm. Body somewhat flattened, the venter flat, sub-stigmatal ridge distinct and the body above slightly triangularly shaped in section, or at least appearing so. A pair of low, polished, conical, rudimentary horns on joint 2 anteriorly; anal feet very minute, not used, the rim of subventral ridge running smoothly around. Soft green; a distinct white line on substigmatal ridge, faintly yellow on joints 2 to 4, distinctly so on joints 11 to 13 and round the anal rim, horn stubs purple brown, the area between them mottled in white and purple, a white edge behind; a yellow dorsal line from the horns over joints 2 to 5 expands on joints 6 to 10 into a patch of creamy white mottled with pinkish and purple, which may be narrow or broad, light or dark, and is expanded in the center of the segments. In the narrow form it stops at the end of joint 10 and is continued by the shadow of a pale dorsal line; in the broad form a diminishing dark purple stripe runs to the anal plate. On the thorax subdorsal and lateral fine faint yellow lines, which become broken into obliques on the abdomen, running from subdorsal anterior on one segment backwards to stigmatal posterior on the next; the last, on joints 11-12, is rather the heaviest and is followed by a weak subdorsal line on joints 12-13, not oblique. The surface is finely peppered in purple and white, the oblique lines being without these dots. Spiracles ochreous, feet reddish; abdominal feet of joints 7 to 10 heavily mottled in purple and white over their bases and, in the dark specimen, up to the substigmatal line covering joints 6 to 11.

Cocoon slight, like thin parchment, spun among leaves at the surface of the ground.

—Dr. Dyar mentioned another result of Mr. Schwarz's brief stop at Key West, namely, the determination of the food plant of *Mieza igninix* Walker. These larvæ were found on the *Bumelia angustifolia* with the *Litodonta* larva, and a moth has just emerged. According to Dr. Dyar this is undoubtedly the same plant on which Mrs. Slosson originally found the species, but it was unidentified then and has remained so till now.* It might be well, he said, to note that the figure of Abbot identified by Packard † as *Eustixia pupula* Hübn., really represents this *Mieza*.

—The following paper, by Mr. Caudell, was then read by the Secretary :

* Journ. N. Y. Ent. Soc., iv, p. 86, 1896.

† Amer. Nat., iv, p. 229, 1870.

BRANCHED HAIRS OF HYMENOPTERA.

By A. N. CAUDELL.

Several years ago, in an attempt to determine which of our Hymenoptera possess branched hairs, I examined almost two hundred species, including representatives of all the families. Of these species twenty-three only possessed branched hairs, the others having only simple ones, which, in some cases, were spirally twisted. Without exception the twenty-three species bearing branched hairs proved to belong to the group Anthophila, or pollen-gatherers, and no representative of this group was found without such hairs. Thus the possession of branched hairs seems a good character for the separation of the Anthophila from the remainder of the Hymenoptera. This character has indeed been used by some writers.

Of the Anthophila somewhat critical studies of the hairs from various portions of the body were made for the purpose of learning the distribution of the various forms, and at which portion of the body they were the most often found. Characters among the hairs for the subdivision of the group were also sought for.

It has generally been stated that branched hairs are found especially on those portions of the insect's body that are used in gathering pollen. In my investigations I examined hairs from the head, dorsal surface of the thorax, dorsal and ventral surfaces of the abdomen, posterior tibiae and basal segment of the posterior tarsus. I found that of these six regions the dorsal surface of the thorax alone possesses branched hairs as a constant character. The thorax must, therefore, be considered the typical branched-hair bearing region, as it is the only place where such hairs are found to be always present. If exceptions should be found to occur here also upon further investigation, is not known.

The invariable presence of branched hairs on the top of the thorax seems a wise providence of nature for facilitating the cross fertilization of plants.

In regard to finding hair characters for the subdivision of the Anthophila I met with no success. While the forms of hairs vary from one- to many-barbed and from short serrations to long branches, the various kinds are distributed among the genera in such a manner as to be, apparently, of no systematic importance. The hairs of closely related genera, as *Bombus* and *Psithyrus*, present no characters for their separation or for the separation of such genera from ones remotely related. Nor do the hairs of the Andrenidae seem to differ from those of the Apidae any more than they do as between different genera.

This subject seems to have received less study than its interest

appears to warrant. The main, and almost the only article of any length, based upon original research, so far as I can find, is by Edward Saunders in the Transactions Entomological Society of London for 1878. This author examined the hairs of one or more species of almost all the genera of British Aculeate Hymenoptera, but none of the Terebrantia. He found that, without exception, members of the Anthophila alone possessed branched or plumose hairs, and he later used that character in classification.

As to the use of these branched hairs there seems to be considerable doubt. Mr. Saunders suggests that they are of use in gathering pollen. As they are characteristic of pollen-gathering groups they are, doubtless, of use in that connection, but that their only use is for gathering pollen is not proved. If such were the case we would scarcely expect to find branched hairs present on parasitic species, such as those of the genus *Nomada*, or absent from the special pollen-collecting portions of the body of some pollenizing species, such as the posterior tarsus of the honey bee. But Coburn states that the explanation of these hairs being pollen-collecting hairs is so plausible as to exclude all other hypotheses. The same author mentions the members of the genera *Ceratina* and *Prosopis* as being without hairs. This is disputed by Saunders, who claims that they do possess a few hairs which retain the character of being branched.

Besides Saunders and Coburn the presence of branched or plumose hairs in the Hymenoptera has been mentioned by Reaumur, Smith, Dimmock and others, but the article by Saunders seems to be the only one of considerable length or importance. Dimmock has given an interesting discussion of the scales of Coleoptera in *Psyche* for 1883. He found, as previously pointed out by Fisher, that branched scales or hairs occur only in the Scarabæidæ.

Mr. Benton said that the branched and twisted hairs on the thorax of bees are necessary for collecting pollen, as the bees twist and turn; whereas the hairs on the legs are used only for combing and brushing that pollen off.

—Dr. Dyar called attention to the different dates of hatching of hibernated mosquito eggs according to the species. Eggs of *Culex canadensis* and *Culex atropalpus* had hatched in March, while those of *Culex triseriatus* were just hatching then (middle of May). These eggs had been deposited at various dates during the summer of 1902.

—Dr. Howard related an interesting case in which mosquitoes had been made the subject of a law-suit. There was an outbreak of malaria in Greensboro, N. C., which was attributed to *Anopheles* breeding in a mill pond owned by Cone Bros., of that place. An injunction was sought against these gentlemen, by the State board of health, to restrain them from maintaining the dam and pond. To abolish this would have entailed the ruin of the community. Cone Bros., therefore, engaged expert entomologists, among whom were the narrator and Mr. F. C. Pratt, who demonstrated that while *Anopheles* was breeding in every pool in and about the village, not a single larva was to be found in the mill pond. Upon a question from Mr. Benton, Dr. Howard explained that this was partly because the water surface of the mill pond was so large as to be constantly disturbed by rain and wind, rendering it unsuitable for the breeding of mosquitoes. Cone Bros. further offered prizes of \$50 to the physicians of the village, some 13 in number, for every *Anopheles* larva they could find in the pond. Only one of them succeeded in finding a dilapidated *Anopheles* larva, for which he duly received his prize. Six of these physicians then served as witnesses for the defendant, and the case ultimately grew so strong against the State that it was dismissed.

—Mr. Schwarz stated that on his return from Cuba he stopped for a short time at Key West, Fla., to collect certain Scolytid beetles which he discovered there in 1887. To his sorrow he found that all the fig-trees, mastic-trees and various other tropical trees had been cut down and Scolytids had disappeared from the island. Some other interesting insects were found, however. For some years a flowering tree of large size (*Cordia sebestana*) had been introduced into the gardens of Key West, and the leaves of this tree were being devoured by a large Cassidid beetle (*Eury-pepla jamaicensis* Linnæus), which has hitherto not been noticed from the United States. Both the plant and the beetle are now thoroughly acclimatized in Key West. All over the island of Cuba blossoms of the cultivated egg-plant were infested by a little weevil (*Anthonomus varipes* Duval). The original wild food-plant of the species was found to be an arborescent solanaceous plant (*Solanum torvum*). This same weed had of late

years invaded the tropical parts of Florida, and the same *Anthonomus* was found in abundance on Key West. The same beetle had been collected previously by Mrs. A. T. Slosson at Miami, but the species was not properly recognized at that time.

—Mr. Schwarz exhibited, also, leaves of the Indian Laurel (*Ficus indica*), which is planted extensively both in Cuba and on Key West as a shade tree. On all the trees examined the leaves of the terminal twigs were found to be tightly rolled up; so that it appeared as if those twigs were dead and destitute of leaves. The author of this mischief proved to be a species of *Phlæothrips* (named by Mr. T. Pergande), and observations showed that a number of females congregate on the upper side of the leaves to deposit their eggs, whereupon the latter begin to curl up. Mr. Schwarz stated that he was not aware that any species of Thripidæ with such social habits was referred to in the literature.

—Mr. Currie then read a note, by Mr. Caudell, on “The Blattid Fauna of the World.” The author stated that he had just completed a catalogue of the cockroaches of the entire world, with the intention of having it published, together with catalogues of the other non-saltatorial families of Orthoptera. He found, however, that the same work was being done by W. F. Kirby, of the British Museum. Better facilities for such work, in the way of more complete collections and literature, were found in England, and so he had given over the thought of publishing. As worked out in a manuscript catalogue, the Blattid Fauna of the World results as follows: Of genera there are 222 described, 33 of which are synonyms, leaving 189 valid. Of described species there are 1,886, 202 being synonyms, leaving 1,684 good species.

—Mr. Heidemann read a note and exhibited drawings of the genitalia of *Podisus cynicus* Say, and *P. bracteatus* Fitch, and called attention to the important differences between these two species. He has presented for publication the following paper on the subject:

REMARKS ON THE GENITALIA OF *PODISUS CYNICUS* SAY
AND *PODISUS BRACTEATUS* FITCH.

By OTTO HEIDEMANN.

Mr. A. N. Caudell read a paper*—"Some Insects from the Summit of Pike's Peak, Found on Snow"—before the Entomological Society, of Washington, February 13, 1902. The insects were collected by him and the specimens of the order Hemiptera were turned over to me for determination. In his paper I have given the following account in referring to numerous specimens of the species *Podisus cynicus* Say:

"Twelve adults, males and females. Six of these specimens evidently belong to another species, probably *Podisus bracteatus* Fitch. This species is considered by some American authors as synonymous with *Podisus cynicus* Say. But the writer has lately had occasion to examine Fitch's type-specimen, a female (U. S. Nat. Mus.), and to compare the same with specimens of *P. cynicus* Say, and there seems to him no doubt that *P. bracteatus* Fitch will have to stand as a separate species. The female genitalia are decidedly distinct in these two forms; there are also differences in the shape of the body, which in *P. bracteatus* is comparatively broader and shorter. However, more material from other localities will have to be examined, and especially the male characters, before a definite conclusion can be reached."

Since then I have had the opportunity of examining many more specimens from different localities, and have found that the male genitalia also are very distinct in these two species. This character is evidently of most importance in separating the species of the genus *Podisus*, because all the other characters formerly used, such as the shape of pronotum, the punctures and colors, are not constant in the specimens. The accompanying drawing (Fig. 1) will show more decidedly the differences between these two species.

In *Podisus cynicus*, female (A, 2), the inner margins of the side pieces of the first genital segment are cut straight, giving the middle plate a square appearance; while in *P. bracteatus*, on the contrary (B, 2), these margins are obliquely formed, making the middle plate distinctly triangular. The male genitalia differ still more, as may be readily observed in the drawing. The ventral terminal segment of the abdomen forms quite a deep cavity, from which a kind of clasper protrudes on both sides of the cavity, termed by Dr. D. Sharp "the superior lateral pro-

* Proc. Ent. Soc., Washington, v, No. 1, p. 80, 1902.

cess," in his well-known paper, "On the Structure of the Terminal Segment in Some Male Hemiptera."* In *P. cynicus*,

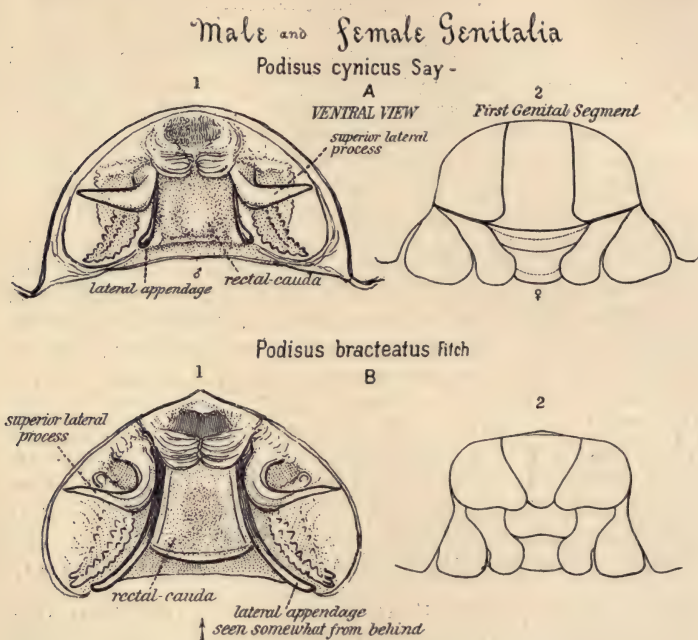


FIG. 1.

male (A, 1), this process is short, comparatively broad and rather flat; but in the other species (B, 1), it is peculiarly twisted from the base, narrow and more acutely pointed. Directly underneath these parts, also, a pair of so-called lateral appendages extend straight forward, which in *P. cynicus* are short and club-like in shape. *P. bracteatus*, on the contrary, has these appendages very long, reaching the outer edge of the cavity, and cylindrical in form. In the middle of the cavity there is another piece, the rectal cauda, covering the inner organs of the genitalia. To bring out these inner parts would need careful dissection. Anyhow, the shape of the exterior parts, the superior lateral processes and the lateral appendages furnish sufficient characters for distinguishing *Podisus cynicus* Say at once from *Podisus bracteatus* Fitch.

* Trans. Ent. Soc. London, pp. 399-425, 1890.

—Mr. Simpson exhibited a collection made by Mr. Caudell of miscellaneous insects caught on the sticky secretions of the mountain laurel (*Kalmia latifolia*). He also showed specimens of dead branches of apple trees that were once infested by codling moth pupæ, and which were made a point of attack by woodpeckers.

JUNE 18, 1903.

The 179th regular meeting was held at the residence of Dr. C. W. Stiles, 1718 Q street N.W. Vice-President Banks in the chair, and Messrs. Dodge, Gill, Heidemann, Kotinsky, Marlatt, Patten and Stiles, members, and Mr. Grayton Ransom, visitor, also present.

Mr. Grayton Ransom, of the Bureau of Animal Industry, U. S. Department of Agriculture, was elected an active member of the Society.

Dr. Stiles moved that the congratulations of the Society be telegraphed to Mr. Ashmead at Pittsburg, in view of the fact that the doctorate was to be conferred upon him on that date by the Western University of Pennsylvania. The motion was unanimously carried, and Dr. Stiles was asked to word and send the telegram.

—Mr. Schwarz exhibited a specimen of the Curculionid beetle *Hormops abducens* LeConte, which he collected at Plummer's Island, Maryland, in May, and which is a new accession to the fauna of the District. Only one specimen of this species was previously recorded, found by Hubbard and Schwarz at Capron, Fla.

—Dr. Gill asked Mr. Schwarz whether the larvæ of Calandrid beetles were used as food on the island of Cuba. Mr. Schwarz replied that to his knowledge they were not so used in Cuba.

—Mr. Heidemann exhibited a male specimen of *Aradus quadrilineatus* Say, which he found in a decaying trunk. In his collection he had specimens from Canada and from Cleveland, Ohio, and also one specimen coming from Georgia. He exhibited also a specimen of *Aradus robustus* Uhler, which he had usually obtained by beating trees, but last week he found an old trunk of

Gleditschia triacanthus, in the crevices of the bark of which he found a number of specimens of this species. He further stated that in the collection of insects made by Mr. Franklin Sherman, Jr., in North Carolina, he found a Reduviid belonging to the sub-family Stenopodinae, near the genus *Gnathobleda*, which Champion described and figured as *Schumannia mexicana*, in The Biologia Centrali-Americana. The description was based on one specimen which came from Vera Cruz, Mexico, and it was remarkable, he said, that this same species should have been found in North Carolina. The genus is distinguished by the narrow thorax and the strong, long spines on the trochanter.

—Mr. Schwarz stated that he had a list of the injurious insects of Cuba as observed by him this spring. The champion of all injurious insects there is *Atta cephalotes*, the leaf-cutting ant. The next place, however, should be given to a species of myriapod, which plays there the rôle of our cutworms. It eats and injures anything that is cultivated, such as strawberry, cabbage, egg-plant, young orange trees, etc. Where he had been called to find the cause of injury to cultivated vegetation, he had always found this pest to be the author of it. Mr. O. F. Cook identified it as *Orthomorpha coarctata* Saussure, a species which, Mr. Cook stated, probably came originally from the East Indies. The only remedy that Mr. Schwarz could suggest against these pests was to put ashes or tobacco dust sweepings upon the ground. He found these creatures especially abundant after a rain.

—Mr. Dodge then presented his paper entitled "Gloveriana." He stated that 15 years ago he had published Townend Glover's biography.* The information for this he had gathered from a scrap-book, which was made up of MS. notes and plates made by Glover. He gave the stages of evolution in the making of Glover's plates, which were at first of pocket size and of insects only, so that they might be conveniently carried in a pocket notebook. Later he determined to have drawings of the plants infested to accompany those of the insects, and later still he had thought of undertaking to publish and illustrate the insect fauna of the entire United States. Mr. Dodge exhibited these scrap-

* Bull. Div. Ent. U. S. Dept. Agr., No. 18, 1888.

books, containing drawings that were made as long ago as 1850, and a letter that T. W. Harris at one time wrote to Glover proposing that they work together.

Upon a question from Mr. Schwarz, Dr. Gill stated that Glover's works should be regarded as publications, because they were put in permanent condition and copyrighted. Mr. Dodge stated that fifteen complete sets were issued and distributed to institutions and individuals. Prof. Glover commenced with the Orthoptera and then followed with the Diptera and the Heteroptera. Mr. Schwarz stated that Glover's works were not recognized as publications, and Dr. Dyar had correctly omitted them from his catalogue. Mr. Dodge replied that Dr. Hagen recognized them as publications. Mr. Schwarz stated that Glover named but one insect during his lifetime, and this species, *Psylla nigripennis*, he named only by accident. Dr. Gill recalled that at one time Glover had asked him to take up the study of spiders. Upon a question from Mr. Schwarz as to what became of the specimens from which Glover made his drawings, Mr. Dodge replied that Glover had no use for specimens after he had drawn them. Glover refused absolutely to use any adequately prepared material for his work; besides, many specimens came from collectors, and were returned to them. Mr. Schwarz said that he could still recognize some of Glover's specimens in the old collection of the United States National Museum.

—Mr. Schwarz then read the following:

THE COTTON-BOLL WEEVIL IN CUBA.

(*Anthonomus grandis* Boheman.)

By E. A. SCHWARZ.

Many years ago Dr. Juan Gundlach found *Anthonomus grandis* in Cuba, in the central portion, near Cardenas, and in the western portion, near San Cristobal, but no information on its mode of life or food-plant was furnished by him. In the year 1892 Mr. Eduardo Ferrer, one of the most prominent agriculturists of Cuba, planted at Cayamas, in the southern portion of the province of Sta. Clara, two small fields of Egyptian cotton, the two fields being about two miles distant from each other. One of these was attacked by the *Anthonomus* as soon

as the plants commenced to produce squares, and not a single pound of cotton has been harvested from this field. During this time the second field remained intact and produced a large amount of cotton, until about five months later (December, 1892), when the weevil infested this field, too, and before the middle of February the plants had ceased to produce bolls or even flowers, the weevils infesting and destroying every square that made its appearance.

Toward the end of February the writer was commissioned by Dr. L. O. Howard to proceed to Cayamas, Cuba, in order to find out, if possible, the original food-plant of the *Anthonomus*, a point in the natural history of the insect which had hitherto remained unknown. Up to the time of my visit to Cuba I had shared in the opinion held by many entomologists connected with the Boll-weevil investigation, that the original food-plant of the weevil would prove to be some Malvaceous plant generically different from *Gossypium*; accordingly, some time was at first spent by me at Cayamas in investigating every Malvaceous plant,* although with no success.

Previous to my arrival, and as soon as the weevils infested his cultivated cotton, Mr. Ferrer had examined the wild cotton plants growing in the vicinity of his cultivated fields, but without finding any trace of the insect. As a matter of course, the very first thing I did upon my arrival on the spot was to closely re-examine these plants, but they proved to be free from weevils. However, soon afterwards the insect was found breeding on wild cotton in many places around Cayamas.

There are two distinct species of wild cotton in Cuba, both of them arborescent and perennial plants, which, if undisturbed, attain a great age. Even when growing among the dense, tall grasses and weeds they reach a height of from eight to ten feet, and, when growing under more favorable conditions, are often fifteen or more feet in height. The species never intergrade with each other, although they are difficult to distinguish without examination of the ripe bolls.

The first of these species is called by the Cubans the "Loose" or "Wild" cotton, "*algodon sylvestre*." It is probably the *Gossypium brasiliense* of the botanists. In general appearance, and in the arrangement and nature of the seeds, it greatly resembles our sea-island cotton, but is very much taller and has a shorter

*The young and more succulent fruits of a species of *Malvastrum* showed holes exactly corresponding in size with the punctures of the *Anthonomus*, but they proved to be made by the larva of a *Microlepidopteron* (the particular species has not been bred), which feeds on the undeveloped seeds.

fiber. A number of varieties of this species occur, some of which, if properly cultivated, would no doubt be of considerable commercial value.

The second species, the "kidney" cotton, or "algodon de viñon," of the Cubans, is extremely distinct from the fact that the seeds are consolidated into kidney-shaped masses. The species is not variable, and manifestly represents an ancient type unchanged by the hand of man. It is, at present time, without commercial value since the fiber cannot be ginned by any machinery now in use.

Neither species is exactly what we would call a wild plant, for, since prehistoric times, the natives have taken care of the plants, and have used the fiber for all sorts of domestic purposes. At present the Cubans living either in the suburbs of the cities or in the open country usually have one or two, rarely more, cotton trees planted in their yards or gardens; but many plants, usually in groups of several specimens each, may be found in the less inhabited parts of the island remote from any human habitation. The present natives know the exact location of every cotton plant in their vicinity, although apparently growing perfectly wild. Mr. Ferrer informs me, however, that in such instances there was probably a hut or a settlement on the place in former times.

In the province of Sta. Clara both species of wild cotton occur in about equal numbers, while in the vicinity of Havana the loose cotton prevails, and the kidney cotton is met with in exceptional instances only.

The following is a short summary of the examination made by Mr. Ferrer and myself of every wild cotton plant growing within easy reach around Cayamas. We had also the kind assistance of several planters who took an interest in this subject. Finally, a man was hired and trained, who visited, within a fortnight, about 90 more remote localities, bringing samples of infested squares or bolls of every wild cotton plant he met with.

Anthonomus grandis is never common, usually rare, on the wild cotton plants, and is never appreciably injurious to them. To find ten, or even less, infested squares or bolls on a large-sized tree requires considerable time, even for an experienced field entomologist. Solitary plants are *usually* free from weevils while small groups of plants are *occasionally* free. In a single instance, a patch of about 50 plants of kidney cotton was found remote from any house, and here the weevils were more numerous than elsewhere. I calculated that about one square* out of fifteen was infested, which percentage, however, did not prevent the plants from being covered with healthy flowers and bolls.

*On the wild cotton of Cuba, the *Anthonomus* prefers the squares to the bolls for the purpose of oviposition.

The kidney cotton is much preferred by the *Anthonomus* to the loose cotton. In fact, trees of the latter species, if growing by themselves, are, as a rule, not infested,* whereas if they grow in close proximity to the kidney cotton they are liable to infestation, although always in a lesser degree than the kidney cotton.

From these observations I firmly believe that, as far as Cuba is concerned, the kidney cotton is the original food-plant of the weevil. Furthermore, I do not hesitate to assert, after my experience in Cuba, that *Anthonomus grandis*, wherever it occurs, has no other food-plants than the various species or varieties of the genus *Gossypium*. The few scattered notes that Dr. Howard has been able to obtain regarding the boll-weevil in the more tropical parts of Central America appear to corroborate the conclusions obtained in Cuba.

Whether *Anthonomus grandis* and its food-plant are natives of Cuba, or whether both have, in ancient times, been imported from the Central American continent, is a question the answer to which seems to be lost in antiquity.

In the cotton belts of Texas and Northern Mexico by far the largest number of the weevils perish, from various causes, during the cold season. Only a few successfully hibernate, and form, in the ensuing spring, the nucleus of a new set of generations, the weevils increasing in numbers until late in the fall. The mild winter temperature of Cuba, however, does not prevent the cotton plants from producing new squares, flowers, or bolls, nor the *Anthonomus* from breeding. As to the plants of the cultivated cotton in Cuba, some retardation in growth is noticeable during the colder months, and the number of weevils upon them is then lessened from the inability of the plants to produce sufficient food supply. But the wild cotton plants of Cuba are in no way affected by the colder weather; nevertheless, the weevils have never been known, either in winter or summer time, to become numerous enough to prevent these plants from copiously flowering or ripening their bolls; whereas, as stated above, the effect of the attack of the weevil on cultivated cotton resulted, within a few weeks, in the complete disappearance of flowers and bolls. The same phenomenon has been observed in many other species of insects which are not, or but little, injurious to their original food-plants, but which, when transferred to the same or an allied plant under cultivation, become very destructive.

To the question of parasites of the boll-weevil much attention was paid by me while in Cuba, but upon opening many hundreds

* It is probably for this reason that I failed to find the weevil in the vicinity of Havana.

of infested squares or bolls I never saw the slightest trace of a parasite. From the cultivated fields about 400 infested squares were collected and a correspondingly large number of weevils were bred from them, but not a single specimen of a parasite was obtained.

The above notes are abstracted from my letters written to Dr. Howard.

In the discussion Mr. Banks suggested that the loose cotton might have been the original food plant, because it is less injured, which is usually the case with abandoned food plants; to which Mr. Schwarz replied that this may be correct, if proven. He further stated that the *Gossypium brasiliense* is probably also found in South America, yet Koebele never found a specimen of the weevil when he explored the cotton regions near Bahia and Pernambuco. The distribution of the insect shows it to be of Central American origin. Mr. Marlatt stated that it would be of great interest to know whether these cottons are immune to weevil. At present they are scattered, there being but few plants grown on a large area, and therefore they are not more seriously infested; but he wondered if the habits of the insect would not change were these plants grown on a large scale. He thought that the chances were rather in favor of it since, where plants are more abundant, the insect is found in proportionately larger numbers. This was further discussed by Messrs. Gill and Dodge. Mr. Schwarz stated that his host, Mr. Ferrer, of Cayamas, had published a series of important articles in the "Diario de la Marina," of Havana, Cuba (issues of March 21 to March 27, 1903), on the history of cotton and on cotton cultivation in Cuba, which included a chapter on the boll-weevil.

OCTOBER 8, 1903.

The 180th regular meeting was held at the residence of Dr. H. G. Dyar, 1512 Twenty-first street, N.W. Vice-President Banks occupied the chair, and Messrs. Ashmead, Barber, Busck, Currie, Doolittle, Dyar, Gill, Heidemann, Howard, Kotinsky, Marlatt, Morris, Schwarz and Waite, members, and Mr. E. S. G. Titus, visitor, also present.

Mr. E. S. G. Titus, of the Division of Entomology, U. S. Department of Agriculture, was elected an active member of the Society.

—Dr. Dyar exhibited moths and larvæ of three species of *Diacrisia* (formerly *Antarctia*), and presented for publication the following:

NOTE ON THE DISTRIBUTION OF THE RED FORMS OF DIACRISIA.

By HARRISON G. DYAR.

We have recognized heretofore two species of *Diacrisia* from the West, *rubra* Neumægen and *vagans* Boisduval. There exists a third in the mountains about Kootenay Lake, which I would distinguish as *D. kasloa* in the following synoptic form:

- ♂ smaller than ♀, the wings thinly scaled and somewhat transparent.
- ♂ blackish or red, ♀ brownish red, hind wings dark *rubra*.
- ♂ as large as ♀, the wings thickly scaled.
- ♂ light mouse gray or blackish; ♀ red brown *vagans*.
- ♂ and ♀ alike, bright red *kasloa*.

Diacrisia kasloa, n. sp.

♂ with the thorax and fore wings dark red brown to bright crimson, marked by a few dusky scales, indicating discal dot and outer line; hind wings black, veins and fringe more or less broadly reddish.

♀ deep crimson, the fore wings scarcely marked; hind wings black on basal five-sixths or the black reduced to discal dot, broken submarginal band and shading along inner margin. Size and shape of *vagans*.

D. vagans occurs in California and extends much to the East. I have typical examples from Rossland, B. C., not very far from Kootenay Lake. At Kaslo, on the lake, however, all the specimens are of the bright red form. *D. rubra* occupies the northern Pacific Coast region and extends as far as Mount Hood, Oregon. It may prove that the three forms are but geographical races of one species, though they certainly appear distinct, and must be kept separate for the present at least. The larvæ of *kasloa* were obtained by me at Kaslo, B. C.; those of *rubra* were bred from eggs kindly sent by Rev. G. W. Taylor from Wellington, B. C. They are alike. Stretch's description of the ♂ *vagans* larva differs in being darker, the dorsal warts and hairs blackish instead of brown; his ♀ larva appears to correspond with the larvæ before us. I failed to observe this curious sexual difference in color in the larvæ of *rubra*. Possibly my larvæ are all females. I had forgotten Stretch's observation, so that I did not direct my

attention to the point until now, when I have only the inflated larvæ. But a portion of the larvæ of *kasloa* are blackish instead of brown, and these are doubtless the males.

A considerable number of synonymic and varietal names of *rubra* and *vagans* exist, but, after carefully re-reading the descriptions, I do not think that any of them refer to *kasloa*. Butler's *walsinghami* comes the nearest. It was described from the Rogue River, Oregon, from one female specimen. A second specimen from the same place is referred by Sir G. F. Hampson apparently as normal *rubra*, so that it seems certain that *walsinghami* is only an unusually red ♀ of that species.

—Dr. Dyar presented also the following notes :

A LEPIDOPTERON PARASITIC UPON FULGORIDÆ IN JAPAN.

(*Epipyrops nawai*, n. sp.)

By HARRISON G. DYAR.*

Since commenting before the Society upon the species of *Epipyrops* found in Japan by Mr. Y. Nawa* I have received two specimens of the moth from that gentleman. The specimens, females, agree with the figures published in "The Insect World." The venation is correctly shown, except that the bar between veins 7 and 8 of hind wings should be continuous. The species may appropriately be named *Epipyrops nawai*, after its discoverer. The entire insect is black, the fore wings with many irregular lines of raised bluish metallic scales. Expanse, 22 mm.

Type.—No. 6984, U. S. National Museum.

Specimens were exhibited.

HALESIDOTA MACULATA HARRIS, AND ITS VARIETIES.

By HARRISON G. DYAR.

The past season's collecting has brought to light some new facts concerning this species. It has been shown that the larva of the form *alni*, described from the Sierra Nevada of California, has red dorsal tufts on a yellow ground when young, replaced by a uniformly brownish yellow coat when mature, disregarding the black ends, which are the same in all the forms. This form occurs in the Kootenay District of British Columbia. I had supposed that the form would be found throughout the Northwest, and, indeed, Sir G. F. Hampson has adopted this conclusion by making *angulifera* Walk., described from Vancouver

* Proc. Ent. Soc. Wash., v, p. 180, 1903, and Insect World, VII, pl. 1, 1903.

Island, synonymous with *alni*. However, this is not the case. Larvæ from Victoria, Shawnigan Lake and Wellington, B. C., have black dorsal tufts on a yellow field when young, and these tufts persist in the mature larva, but in a brownish yellow field, thus showing a form of larva distinct from any previously known in North America. Walker's name *angulifera* may be used for it. The form occurs also on the mainland, at Vancouver, B. C., according to information furnished by Mr. R. V. Harvey.

Mr. H. S. Barber has collected quite a series of *H. maculata* at Eureka, California. Without the larva I am unable to say whether they should be referred to *alni* or *angulifera*. But aside from this matter there is represented among them a very curious variety, which I describe as follows:

***Halesidota maculata*, variety *eureka*, n. var.**

Entirely suffused with brown, all the marks obliterate. Thorax brown, showing a faint lighter shade on vertex of head, patagia and disk. Fore wing brown along costa, inner margin, discal dot and a broad shade beyond it, the rest of the wing lighter yellow brown; hind wing whitish yellow. Except for the brown tone, it strongly suggests *H. bicolor* Walker (*pura* Neumoegen).

Three ♂♂, Eureka, Cal. (H. S. Barber).

Type.—No. 6983, U. S. National Museum.

Specimens of moths and larvæ were exhibited.

—Dr. Dyar showed, also, microscopic slides of the larval and pupal skins of the mosquitoes *Megarhinus rutilus* Coquillett and *M. portoricensis* Røder, and commented upon the structure and systematic position of the larvæ. The slides were prepared by Mr. F. C. Pratt, who had bred the species at Woodstock, Virginia, the past summer. All the males reared belonged to *rutilus* while the females were *portoricensis*. Dr. Dyar said that he had examined Mr. Pratt's slides with some care and could not detect the slightest difference between the skins of *M. portoricensis* and *M. rutilus*. He presented the following description of the larvæ:

THE LARVÆ OF THE MOSQUITOES MEGARHINUS RUTILUS COQUILLETT AND M. PORTORICENSIS RØDER.

By HARRISON G. DYAR.

The head is rounded, *Culex*-shaped; the mouth-brush consists of a pencil of stout curved spines, each with a little claw at

the tip, the bunch folding outward in retraction. The mandibles bear five large teeth, of which the first, second and fourth are larger than the third and fifth; there are a set of fine brushes just within the labrum and on the maxillæ. The antennæ are slender, straight, not very long, uniformly colored brown like the head. The body hairs all arise from large, chitinous plates. Those of the thorax are short, thick and finely branched; of the abdomen longer, with more delicate branches. The chitinated part of the air-tube is short, conic, not much longer than wide, but there is a basal unchitinated portion that does not show on the slides. The tube is without pecten, but bears two small tufts. On the sides of the eighth segment are a pair of large, ragged-edged plates, replacing the comb. The anal segment is ringed, short, the ventral brush confined to the barred area, the wide bars containing eyelet holes from which the tufts arise. The dorsal tuft is small and arises from the upper edge of a rounded, nearly black plate. The posterior rim of the segment is fringed with long spines. The larva falls in the synoptic table with *Psorophora*, differing from that in the presence of a plate on the side of the eighth segment instead of a comb of spines.

—Mr. Schwarz exhibited a specimen of the *Dendrobium* longicorn beetle (*Diaxenes dendrobii* Gahan). This genus of Cerambycidae is known to infest, in the larval state, the stems of various orchid plants which are native to the Philippine Islands and to British Burmah. Plants infested with these beetles have of late years been frequently imported into the orchid houses of Paris and London, and quite a literature has arisen, in the French and English entomological and horticultural journals, on the ravages committed by this beetle upon these costly plants. Mr. Schwarz said that the specimen exhibited was the first one ever recorded from the United States. The plant in question is an East Indian species and was imported by Mr. George Field, a florist of Washington, D. C., by way of London, England. Since there has been only one specimen of the beetle found, there seems to be no danger at present that the species is getting acclimatized in the orchid houses of this country.

—In connection with some remarks made by Mr. Doolittle on the food habits of longicorn beetles, Mr. Schwarz stated that the imagoes of a conspicuous species common in Texas, Arizona

and Mexico (*Dendrobias quadrimaculatus* Dupont), is especially fond of printers' ink and sometimes obliterates the large letters on the posters of theatrical performances, etc., which are pasted on walls and fences.

—Mr. Schwarz then exhibited male and female specimens of a remarkable Meloid beetle (*Leonina neomexicana* Cockerell), which were found at Denver, Colorado, by Mr. S. Arthur Johnson in the cells of bees of the genus *Anthophora*. These specimens, having been kept in alcohol, are the only well-preserved examples known to him; the type specimen in the Dr. Horn collection in Philadelphia is dried and pinned, and does not show any trace of the natural beauty of these insects. At the same time Mr. Schwarz showed specimens of the other parasitic Meloid beetle, *Hornia minutipennis* Riley, found by Mr. Johnson at the same place and under the same conditions as *Leonina*. According to Mr. Schwarz's experience, *Hornia minutipennis* is very widely distributed in the United States. Besides the type specimen from St. Louis, Missouri, there are specimens in the National Museum collection from Washington, D. C., Helena, Montana, and Alameda, California.

—Mr. Heidemann exhibited specimens of *Aulacostethus marmoratus* Say, a species belonging to the hemipterous family Scutelleridæ. They were collected recently at Plummer's Island, Maryland, by Mr. August Busck. This is the first record of this species from the vicinity of Washington, most of the specimens in collections coming from the pine regions of New Jersey. A few weeks after Mr. Busck secured his specimens, Mr. Heidemann visited Plummer's Island himself and captured further examples of the species from juniper by beating. He showed, also, for comparison, specimens of *Aulacostethus simulans* Uhler, the only other known species of the genus, taken by Mr. E. A. Schwarz at Key West, Florida. Neither of the species is common in insect cabinets.

—A discussion ensued in regard to the fauna of Plummer's Island, Maryland. This small island lies in the Potomac river, some ten miles above Washington, D. C., and on it the Washington Biologists' Field Club has erected a small house. Mr. Schwarz stated that the entomological members of the club had, during the

past two years, made an attempt to systematically investigate the fauna of the island. Lack of time had prevented a thorough investigation of the fauna during day time, but a rather thorough collection had been made of insects attracted to light, and some 2,000 or 3,000 species of insects of all orders would be listed from that particular spot at some future date. The fauna of the island shows a great difference from that found within the limits of the District of Columbia proper. Such species as the beetles *Calosoma* and *Hydrophilus*, the water bug *Benacus*, the large may-flies which swarm around the electric lights, and numerous other insects which are common in Washington, do not seem to occur at Plummer's Island. Mr. Schwarz referred, also, to the remarkable difference in fauna between the southern, dry slope of the island and the northern, more shady and more humid side. The fauna of the Virginia shore opposite the island is similar to that of the northern portion of the island. Mr. Morris and Mr. Waite said that Mr. Schwarz's views as to the difference in fauna in that region are borne out by a study of the flora. Mr. Schwarz remarked, also, on the difference in time of appearance of a number of species at Plummer's Island from that on the lower Potomac in the vicinity of Washington. This was especially exemplified in the case of the may-beetles (*Lachnosterna*), concerning which careful records had been published by Dr. John B. Smith in his well known papers on the *Lachnosterna* fauna of Washington, D. C. The insects at Plummer's Island seem to come out one or two weeks later in the season than at Washington.

—Mr. Banks reported that he had taken the Chrysopid *Meleoma signoretti* Fitch at Plummer's Island the past season. This was the first record for the species so far south. It was originally described from the Green Mountains of Vermont and had, since then, been recorded from Mt. Washington and Franconia, New Hampshire, and Sea Cliff, New York.

—Mr. Currie presented the following paper :

AN INSECT-COLLECTING TRIP TO BRITISH COLUMBIA.

By ROLLA P. CURRIE.

During the past summer I was enabled, through the kindness of Dr. H. G. Dyar, leave of absence having been granted me by the U. S. National Museum, to spend about ten weeks, in company with Dr. Dyar and Mr. A. N. Caudell, in an investigation of the insect fauna of the Kootenay District of British Columbia. Our headquarters during this time was the town of Kaslo, situated towards the northern end and on the western shore of Kootenay Lake. Dr. Dyar was the first to arrive on the ground, reaching Kaslo on the 28th of May, while the writer arrived on the 8th of June, and Mr. Caudell on the 15th.

Although occupied principally with collecting and rearing Lepidoptera and mosquitoes, Dr. Dyar nevertheless found time to secure many other insects of various orders. Mr. Caudell did a good share of the collecting although the work of inflating lepidopterous larvæ, which fell to his lot, frequently monopolized his time. The writer, therefore, was the only member of the party who was able to devote himself exclusively to general collecting.

We are much indebted to Mr. J. Wm. Cockle, part proprietor of the Kaslo Hotel and a pioneer in British Columbia, for what success we achieved on the trip. Mr. Cockle is an enthusiastic student and collector of Lepidoptera, and possesses a large and handsome collection of the species occurring in eastern British Columbia. He often accompanied us on our trips and planned several special excursions to interesting localities for our benefit. His thorough knowledge of the region was of great help to us and his interest in our expedition, as manifested not only by donations of specimens but in many other ways, added much to the pleasure of our stay.

I desire to express our thanks to Mr. W. R. Allen, Secretary of the Kaslo & Slocan Railway, for many kindnesses. Mr. Allen at one time made a collection of British Columbia Lepidoptera and presented it to the University of Oxford. Although not actively engaged in collecting at the time of our visit, he nevertheless secured a number of specimens for us, and we captured many good moths in front of the photographic laboratory in his garden, at the electric light which he obligingly left burning for us. He accompanied us on one of our trips and has had printed for us a fine set of his photographs of local scenery. He

also arranged a hand-car trip from Payne Mine to Kaslo for our benefit.

Among the many other persons who helped us by bringing in specimens which came to their notice I would mention in particular Master Stephenson, younger son of the Kaslo druggist, who developed into an enthusiastic collector and devoted considerable time to getting insects for us.

As a result of the summer's work between 38,000 and 39,000 insects, spiders and myriapods were brought back. It seems desirable, therefore, as a preface to Dr. Dyar's paper on British Columbia mosquitoes and to other papers which, it is hoped, will appear from time to time upon different groups of insects contained in the collection, to give this brief account of the trip, together with short descriptions of the localities visited. Prof. C. V. Piper, former Entomologist of the Washington Agricultural College Experiment Station, has kindly furnished me with the scientific names of the trees, shrubs, and other plants mentioned in this article.

Kootenay Lake is located in the Selkirk Mountains in eastern British Columbia and is some eighty miles long by from one to five miles wide. Its water is very cold and up to a short distance from the shore is said to have a uniform depth of 400 feet. The water this year (1903) reached a height of twenty-four feet above low-water mark in the early summer and was still somewhat higher than normal when I left. The mountains rise directly from the shores of the lake to an altitude of 10,000 feet or less. Their summits are usually bare and rocky and, in many cases, have snow on their slopes throughout the summer. The climate is less severe in winter than in the Rocky Mountains, although colder than on the Pacific Coast. Although there is much snow during the late fall, winter and early spring months, the large lakes do not freeze over, but are open for navigation the entire year. Usually the rainfall is light in summer and there are many forest fires; but last summer it rained so frequently as to interfere considerably with our collecting.

The forests in this region are notable on account of the large size and luxuriant growth of the trees—smaller than those of the Pacific Coast, but considerably larger than those in the Rocky Mountains. Giant cedar (*Thuja plicata*) and hemlock (*Tsuga heterophylla*) seem to predominate in the lower altitudes, although interspersed with Western larch (*Larix occidentalis*), yellow pine (*Pinus ponderosa*) and Douglas and Engelmann spruces (*Pseudotsuga mucronata* and *Picea englemanni*). Higher up subalpine fir (*Abies lasiocarpa*) and spruce are the prevailing trees. In the clearings and along the creeks are balm

of Gilead* and aspen poplars (*Populus trichocarpa* and *P. tremuloides*), willow, birch (*Betula papyrifera*), alder (*Alnus tenuifolia*), ceanothus (*Ceanothus velutinus*), etc. Thimbleberry (*Rubus nutkanus*), raspberry (*Rubus strigosus*), gooseberry (*Ribes irriguum*), service-berry (*Amelanchier florida*) and huckleberry (*Vaccinium membranaceum*) are common shrubs, while among the most abundant flowering plants are *Epilobium spicatum*, *Spiraea corymbosa*, a species of *Hieraceum* and *Anaphalis margaritacea*. Between the upper portion of the thickly timbered area and the rocky peaks of the mountain summits there is usually a considerable area with scant and stunted trees, or no trees at all, the ground covered with sedge, heather (*Phyllodoce empetriformis* and *Cassiope mertensiana*) and a variety of boreal or subarctic flowering plants.

Following is a list of the localities where collections were made. Whenever possible the exact or approximate altitude is given.

Kaslo (altitude 1,670 feet), May 29 to August 20.—As stated above, this town, located on Kootenay Lake, was our headquarters, and the great majority of our specimens were obtained within easy walking or rowing distance of there. The town is built upon the south side of a small bay and is bounded on the south by Kaslo Creek—at the time of our arrival a large and powerful mountain torrent though diminishing greatly in volume later in the season. At no place did collecting give better results than here. The creek harbored a variety of neuropteroid and other aquatic larvæ, while the deciduous trees which lined its banks were the resting places of many stoneflies, caddisflies and the like. From the many young trees springing up in the clearings back of the town and in those places which had, a few years back, been visited by forest fires, a variety of wood-inhabiting Coleoptera were beaten, together with parasitic Hymenoptera, Chrysopidæ, Hemerobiidæ and Raphidiidæ, small Diptera, Homoptera and Heteroptera, and innumerable spiders. The thimbleberry and other bushes made excellent sweeping for small Hymenoptera; the clover patches, on sunny days, were alive with various kinds of bees; and the grass and weeds of pastures and vacant lots yielded an embarrassing number of various small Diptera. Butterflies and moths of many kinds were abundant, especially in the clearings and more open forest and along the roadsides, while many of the night-flying moths could be detected and put to flight by thrashing the underbrush, shrubs and young trees with a stout stick or pole. Caddisworms, mosquito larvæ, aquatic Coleoptera and Hemiptera, etc., were

* The balm of Gilead poplar is called "cottonwood" in the Northwest.

found in abundance in the spring-fed pools and marshy forest ponds, and adults of these insects could, of course, be found in the neighborhood.

Although sugaring for moths was tried at other localities, Kaslo was the only place where our efforts met with marked success. We began sugaring about the middle of June and in that month sugared three times, according to my record. During the first half of July we went out about three times a week and during the remainder of July and in August sugared almost every evening when not prevented by rain. During the early part of summer, moths were not particularly abundant at sugar, and 100 or 200 specimens an evening was considered a fair catch. But later in the season the number of moths steadily increased and during August, up to the time we left, 1,000 or 2,000 specimens could easily be taken almost every evening. On one occasion we even exceeded that number and secured 2,330. Species as well as numbers of individuals were well represented, 75 species a night being the usual average in the latter part of the collecting. Although there were naturally long series of some species, yet of not many did we secure a larger number of specimens than we had use for.

Our method of procedure, though probably not essentially different from that of others who sugar for moths, was as follows: About 7 o'clock or 7.30 in the evening we went over the route and put on the "sugar," which, according to Mr. Cockle's formula, was made by heating a mixture of three pounds of sugar and one pound of molasses until thoroughly dissolved, then thinning with beer until of a syrupy consistence and adding a small glass of rum. This was spread, by means of a good-sized whitewash brush, upon stumps, fence boards and palings, telegraph poles, etc., along certain roads and paths back of Kaslo, usually along a circuitous route which brought us back to the starting point without going twice over the same ground. About 9.30 we started out again, equipped with a lantern, several large and small cyanide jars of good strength, a few vials of alcohol and two large muslin sacks one of which contained 150 or 200 empty paper pill boxes. The moths were caught on the sugar by clapping the cyanide jar over them and, when partially overcome by the fumes, they were removed to pill boxes, each moth being put, when possible, in a separate box.* Each pill box, as it was filled, was then transferred to the empty muslin sack. Next morning the boxes were opened, male moths removed to cyanide bottles and the females confined in glass jars in order, if possible, to secure eggs from them for life history studies.

* The Microlepidoptera were not kept alive, but were collected directly into chloroform killing vials and left there till our return to the hotel.

After the first of August we discarded the pill boxes, as it was deemed now too late in the season to start new life-history cultures, and Dr. Dyar was sufficiently occupied with caring for those already obtained. It was noticed that many moths fell from the sugar into the grass and onto the ground and were lost while we were engaged in collecting the others. Mr. Caudell, however, soon contrived a way to prevent this. A semicircle of springy wire was sewed to the top of a cloth funnel about one foot in diameter the bottom of which, furnished with a strong elastic, fitted tightly around the mouth of a large cyanide jar of extra strength. On approaching a sugared tree, pole or stump the unwired side of the funnel was made to fit closely around it just below the lower moths. A little jarring and blowing, or a light brushing with the fingers would precipitate them all into the funnel and down into the cyanide jar below. The jar was then corked, and as soon as the moths became quiet they were transferred to a storage cyanide jar and packed lightly between layers of cotton. A canvas apron with a number of pockets, devised by Mr. Caudell, served admirably the purpose of carrying a convenient number of cyanide jars so as to be immediately available. On the warmer evenings when there was considerable moisture in the air there seemed to be a greater flight of moths than when it was cold and dry; and in moist weather we noticed that it was unnecessary to put on fresh sugar every evening, for just as many, or even more, moths were captured when the sugar was a day, or even two days, old.

Moths were by no means the only insects attracted to the sugar. A species of *Centophilus* was frequently taken, and daddy-long-legs (Phalangidea) were attracted in some numbers. One species of *Chrysopa* was often taken at the sugar, as also a few small caddisflies and some specimens of a longicorn beetle, *Pachyta spurca* LeConte. Some of our sugared stumps became so thickly infested with ants that other insects would not alight on them. We noticed, also, in several places where a stump was sugared but a few inches above the ground, that a large toad or a tree frog was nearly always stationed at its base to capture the moths which alighted within its reach. One especial stump seemed to be a favorite, for as many as four toads were sometimes noticed beside it.

As the nights were nearly always cool there was never any such flight of moths to light as we are accustomed to in more southern localities—around Washington, D. C., for instance; but a small number could be secured by going the rounds of the electric lights in Kaslo and visiting the electric-light plant at the creek. The Bombycoid moths, which are not attracted to sugar, were mostly taken at light. Toward the close of the season we rigged

up a large white sheet in what appeared to be a favorable locality and placed a good lantern and reflector behind it; but this apparatus was so little of a success in attracting moths that we abandoned it after a few trials.

Besides the localities immediately around Kaslo, specimens obtained from several near-by places on or near Kootenay Lake bear Kaslo labels. One of these we allude to in our notes as "*Lilypad Lake*," and some of our captures have this additional label. It is a small marshy pond, filled with water lillies and other aquatic plants, about a mile and a half south of Kaslo on the road leading to Mirror Lake. This was a favorite locality for collecting mosquitoes and caddisflies, in their different stages, and seemed to be the nearest place to Kaslo where dragonflies bred in any numbers. The shores of the "lake" were covered with a dense growth of trees and shrubs, and about the only way to secure dragonflies was by walking out over the water on some prostrate log and waiting for them to come within reach, taking care to avoid losing one's balance when making a pass at them. *Mirror Lake*, three miles south of Kaslo, is considerably larger than Lilypad Lake and less overgrown with aquatic plants. It is joined to Kootenay Lake by a covered ditch and is but a few steps distant. In winter enough ice is harvested from it to supply the country near by. This proved an excellent collecting ground for dragonflies, mayflies and caddisflies, and on the moist shores Saldid bugs were abundant. Many of the caddisflies were discovered by jarring the branches of the trees near the lake, thus putting them to flight and making their capture possible. Some of the specimens bear Mirror Lake labels in addition to Kaslo labels. *Fletcher's Ranch*, about five miles south of Kaslo and at some elevation above the lake, was visited by Dr. Dyar, Mr. Cockle and myself on June 11. The place was reached by taking a rowboat to a point some distance south of Mirror Lake, and then following a road up the mountain for a short way. Here a mountain meadow and pasture, covered in some places by a few inches of water, made a good collecting ground for dragonflies and a variety of other insects. The mouth of *Cooper Creek*, about three miles north of Kaslo on the opposite side of the lake, was several times visited. Beating was good here, and on one occasion, during June when the water in the creek was high, I collected a number of Carabid beetles, centipedes, spiders, etc., in the drift brought down by the creek. *Powder Creek*, opposite and a little south of Kaslo on the east side of the lake, has, near its mouth, a beautiful waterfall some forty feet in height. The creek proved a good collecting ground for caddisflies and stoneflies, and was the only locality near Kaslo where I found ant-lions, several pits being discovered in the sand.

Kaslo Creek, June 18 and 30.—On these dates Mr. Caudell and I made trips by the Kaslo & Slocan Railway to points respectively sixteen and ten miles west of Kaslo. Specimens collected at these points bear the label "Kaslo Creek" for want of a more definite locality. The railroad follows up the creek which, in many places, is lined with pools of standing water affording an abundance of Culicid and caddisfly larvæ and other aquatic insects. On these trips we secured specimens of the enormous predaceous Culicid larva *Eucorethra underwoodi* Underwood. At the time we thought they were something new, but on returning to Kaslo found that Dr. Dyar had taken smaller specimens of the same larva near Kaslo some time before and had them in a breeding jar in the hotel. The rank growth of grass and weeds made good sweeping, and we obtained a number of the delicate little mayflies which were hovering in undulating swarms above the railroad track. On June 30, at the ten-mile locality, I secured a specimen of the rare and interesting aquatic beetle *Amphizoa* among drift wood in the creek. On returning from one of these trips we discovered that holding a net out of the window of the moving train was an easy and profitable method of sweeping.

Lardo (altitude 1,670 feet), July 7.—This town is situated at the north end of Kootenay Lake about twenty miles from Kaslo. Dr. Dyar visited the place on the afternoon of July 7 and secured a few insects.

Antoine Mine, McGuigan (altitude about 10,000 feet).—This mine is located in what is known as the McGuigan Basin, in the mountains south of McGuigan—a station on the Kaslo & Slocan Railway about twenty-five miles west of Kaslo. Mr. Cockle had planned an excursion to this locality for August, but rainy weather necessitated giving it up. Nevertheless, Mr. Anderson of the Antoine Mine, who had kindly invited us to come there, collected a few specimens for us.

Frye Creek (altitude 1,670 feet), July 23.—The mouth of this creek, about nine miles north of Kaslo on the east side of the lake, is a favorite camping and picnic ground, and we took advantage of a Sunday-school excursion to visit the place. There is quite a stretch of sandy beach here and huckleberries are plentiful—hence its popularity. The scenery in Frye Creek canyon is very wild and beautiful. An excellent trail has been constructed through it for several miles giving a good opportunity of viewing its beauties and collecting insects. The collecting at this place pleased Mr. Caudell so well that he wandered far up the canyon, and when the excursion steamboat was ready to return to Kaslo he was nowhere to be found. After a half hour's waiting we were rewarded by seeing him saunter up serene and

smiling, in entire ignorance of the anxiety of his friends and the impatience to get home of those who knew not the fascinations of "bug hunting."

Ainsworth, July 10 and 11.—This is a small mining town on the western shore of Kootenay Lake about twelve miles south of Kaslo. In the mountains back of the town—which rise abruptly from the lake—about three miles distant by wagon road and at an elevation of about 5,000 feet, is an interesting limestone cave, known as Cody's Cave. As this cave is located in a good collecting region Mr. Cockle planned a trip there, and on the morning of July 10 Dr. Dyar, Mr. Caudell, Messrs. Kane and Lucas of Kaslo, and myself accompanied him by steamer to Ainsworth. Here the Presbyterian minister, Mr. G. H. Findley, who was much interested in the cave and thoroughly familiar with it, volunteered to act as our guide. We found collecting good all along the road on the way up and secured quite a number of specimens at altitudes between 2,500 and 5,000 feet. About eleven o'clock we stopped by the side of a small creek for lunch. While here we made a short search for aquatic insects and on turning over small stones in the water found a number of mayfly and stonefly nymphs and caddisfly larvæ and a few specimens of the peculiar dipterous larvæ of the family Blepharoceridæ. After lunch we left the road, and a steep climb of a half mile over rocks and fallen timber brought us to the mouth of the cave.

The cave is of considerable size and some time was spent in exploring it. A small, shallow stream of icy cold water flows through it, in some places almost covering the floor. The stalagmites and stalactites were, in most places, small and few in number, indicating, it would seem, that the cave is of comparatively recent origin. In some places the walls of the cave were of considerable height, but in others we were obliged to crawl prostrate in order to get through. Mr. Kane took several flash-light photographs which give an excellent idea of its appearance. The cave seemed to contain no animal life of any kind. This was a disappointment to us, for had it been inhabited by bats or other animals the presence of insects might have been confidently looked for. It was so cold and wet, however, as to be manifestly unfitted for animal life. I examined the limestone mud, delved into out-of-the-way corners and overturned stones in the stream, but found no trace of insects.

After leaving the cave the party, with the exception of Mr. Caudell and myself, returned to Ainsworth and Kaslo, while we went back to the road and followed it a mile and a half further to the No. 1 Mine. Here we were most hospitably entertained by the mine superintendent and his two assistants. The next morning we started down the road towards Ainsworth, collect-

ing as we went. We lunched at the same place as the day before and spent some time sweeping the banks of the creek for neuropteroid insects, hymenopterous parasites, etc., and examined the bed of the stream for aquatic larvæ. Here Mr. Caudell secured a specimen of the water beetle *Amphizoa* and some more Blepharocerid larvæ similar to those I found the day before. About a mile above Ainsworth and near the road is a long pond of several acres area called *Loon Lake*. Here were captured a number of dragonflies, representing several species. We reached Ainsworth late in the afternoon and returned to Kaslo in the evening.

Bear Lake (altitude 3,800 feet), July 20 and 29.—A station on the Kaslo & Slocan Railway twenty miles west of Kaslo. Here are two small mountain lakes from the smallest of which, Fish Lake, Kaslo Creek takes its origin. The other lake, known as Bear Lake, is just west of Fish Lake. Mr. Caudell and I visited this locality on July 20 in company with Mr. Cockle, and spent the afternoon collecting near the two lakes and along the railroad track. Butterflies and bees were found around the flowering plants, and the grass, weeds, small trees and bushes yielded a large number and variety of insects from sweeping. Neuropteroid insects were particularly abundant, especially caddisflies, mayflies and Chrysopidæ, and this was the only locality where we caught *Sialis*. We spent the night here and next morning climbed the mountain north of Bear Lake by switch-back trail to London Hill Mine at the summit. On a subsequent trip (July 29), Mr. Caudell and I sugared for moths along the railroad between Fish and Bear Lakes and secured about 100 specimens. Two-thirds of these belonged to a single species (*Noctua sierræ* Harvey), not uncommon at Kaslo. Hardly any of these moths were peculiar to the locality, but were the same species we had collected at Kaslo earlier in the season.

London Hill Mine, Bear Lake (altitude 7,000 feet), July 21, 28 and 29.—As stated in the last paragraph, Mr. Cockle, Mr. Caudell and I climbed the mountain north of Bear Lake on the morning of July 21 and, as the day was warm and sunny, spent a few hours collecting at the summit near the abandoned London Hill Mine. The forests on the mountains about Bear Lake have been completely destroyed by fires and only the charred and dead tree trunks remain standing. There was little collecting, therefore, on the way up. Around the summit the trees are stunted, grow in isolated and straggling patches, and have not been reached by the fire. These afforded very fair beating and sweeping, and the many blossoms covering the treeless areas attracted a variety of bees, flies and alpine Lepidoptera. On the extreme summit a swarm of Bombyliid, Tachinid and

Syrphid flies was hovering, and a number of them were secured. On the patches of still unmelted snow were a large number of miscellaneous insects, most of them crawling actively about though many others were dead or benumbed with cold. Among these snow insects Coleoptera and parasitic Hymenoptera seemed most abundant, although the orders Hemiptera, Orthoptera and Diptera were also represented. In the afternoon we returned to Bear Lake and took the train for Kaslo.

On July 28, Mr. Caudell and I revisited London Hill Mine in company with Dr. Dyar, this time climbing the mountain on horseback so as to have more energy for collecting when we reached the summit. Threatening showers made collecting rather poor and few Lepidoptera were flying, though we secured a *Parnassius* and a few moths. From the snow patches, which had shrunk considerably since our former visit, we collected a number of insects the majority of which, however, were evidently the same species we secured there before. At the Silver Glance Mine, a short distance below the summit, we spent the night and experienced the customary hearty western hospitality. We tried sugaring that evening, along the trail leading up from the camp, but with no success whatever. The only creatures found at the sugar were a crane fly, a slug and a mouse. Two moths, however, flew to the lantern just as I was entering the cabin, a Geometrid and a specimen of the common Noctuid *Feltia vancouverensis* Grote.

In the morning we went again to the summit, but as the sky was overcast butterfly collecting was poor, and about noon Dr. Dyar went down to Bear Lake and returned to Kaslo. I spent the forenoon in beating the firs and pines and took quite a number of small Diptera and parasitic Hymenoptera, some small stoneflies, a Coniopterygid, two Scolytid beetles, a few longicorns, etc. We again examined the snow patches and found a good variety of insects, among them a caddisfly and a small Hemerobiid. Early in the afternoon the sun came out and we were rewarded by securing a number of Lepidoptera and many flies and bees from the flower-covered slopes. We walked down to Bear Lake in the afternoon, sugared there in the evening and returned to Kaslo next day.

South Fork, August 9.—About five miles from Kaslo, on the Kaslo & Slocan Railway, at the point where the two branches of Kaslo Creek come together, is a station known as South Fork. The branch which has its source in Fish Lake and which is followed by the railroad is called Kaslo Creek, while the other, coming from the south, is known as South Fork. On our way to the Kitchener Glacier, August 9, we left the railroad at South Fork station and took saddle horses and pack outfit for the re-

mainder of the journey. While waiting here for the horses to be saddled and packs adjusted a few miscellaneous insects were picked up.

South Fork Creek, August 9 and 11.—Along this creek there is a good wagon road with trails branching off here and there to a number of mines. Dr. Dyar, Mr. Cockle, Mr. Caudell, Mr. Allen, our guide Joe and myself left South Fork station during the forenoon of August 9 on our way to the Kitchener Glacier. Specimens picked up along this road, going to and returning from the glacier, bear the label "South Fork Creek." The road leads through a forest of large cedars and hemlocks, replaced, as higher altitudes are reached, by spruces and firs. A water-covered meadow near the creek, visited on the return trip (August 11), proved to be an excellent place for collecting mosquitoes and a large number of mayfly nymphs were dredged from the water.

Kokanee Mountain (altitude, at foot of Kitchener Glacier, 7,500 to 8,000 feet), August 10 and 11.—After following the South Fork Creek wagon road for a distance of about seventeen miles from South Fork we turned off to the left and climbed Kokanee Mountain by a switchback trail. Below the peaks of the mountain is a good sized glacier, known as Kitchener Glacier, from which several creeks take their rise, South Fork Creek among them. Below the glacier and at the head of South Fork Creek are two small lakes, one just above the other. At each lake is a mining camp, neither of which were occupied by human beings at the time of our visit, although a porcupine had possession of the camp by the lower lake. We went on to Mansfield Camp, on the upper lake, and made this our stopping place. The cabin stands close beside the lake, and straight across, overhanging the opposite bank, was a wall of glacial ice.

Next morning, August 10, the day was mostly clear and pleasant and we arose early. After donning smoked glasses and waterproof footwear we went on up the mountain and out upon the glacier. On the snow, which largely covered the glacier, were quite a number and variety of insects, many of them dead but a good number alive and uninjured. Mr. Allen took several photographs and Mr. Caudell and I, after exploring the lower end of that part of the glacier which gives rise to Coffee Creek, climbed to the summit of the highest peak of the mountain—said to be the tallest peak in this entire region. It took us about an hour and a half to make the ascent over the snow-covered ice, and we had to use care to avoid the crevasses.

The extreme peak projects above the snow and ice and is a mere mass of large loose rocks, having only a few yards area on top. The view was magnificent. Upon the opposite side to

that by which we made the ascent is an almost precipitous fall of several hundred feet, and far below could be seen small lakes and winding creeks while on all sides the eye overlooked the tops of a wilderness of mountain peaks. The only insects seen here were a few Diptera. We remained awhile to rest and, if possible, to fix in our mind's eye the awe-inspiring picture before us, then returned to camp, collecting on the way. Mr. Caudell secured one specimen of the grasshopper *Podisma polita* Scudder, a species recorded only from Oregon in Scudder's Catalogue of Orthoptera. The others were back from another part of the mountain and reported that collecting was somewhat disappointing and butterflies not as abundant as was expected.

After supper we sugared along the trail from our camp to the camp on the lower lake. About dusk we noticed a few moths flying but on going the rounds later we had almost as little success as on Bear Lake Mountain, the only insects found on the sugar being a few craneflies and one or two caddisflies—no moths whatever. From these two experiences in sugaring at high altitudes we reached the conclusion that in such localities, where the nights are naturally cold, moths cannot be captured by this method of collecting. On our way back to camp Mr. Caudell shot a porcupine. Next morning as it was cloudy and threatened rain we concluded not to remain another day, so packed up our outfit and returned to Kaslo. On the way down the mountain Mr. Allen secured a photograph of the beautiful cascades by which South Fork Creek descends to the valley.

Sandon (altitude 3,800 feet), August 13.—This mining town, about thirty miles from Kaslo, is the western terminus of the Kaslo & Slocan Railway. I left Kaslo on the morning of August 13 on my way home, taking the train to Sandon where I spent the afternoon and night, leaving the next morning for Nakusp. During the afternoon I collected some bees and other Hymenoptera and visited the Slocan Star Mine, said to be one of the best dividend-paying silver mines in this region. Mr. Oscar White, brother of the mine superintendent, showed me through a good part of it, and explained everything to me most interestingly. In the evening I made the rounds of the electric lights and secured about 90 moths, representing a good variety of species. Mr. Geo. C. Robbins, an employee of the Payne Mine, went around with me, provided me with extra cyanide jars and helped me in catching the specimens. Since my return to Washington he has sent us some additional specimens.

Revelstoke (altitude 1,475 feet), August 14.—As stated above, I left Sandon on the morning of the 14th for Nakusp on the Upper Arrow Lake, where I took steamer northward to Arrowhead and train thence to Revelstoke. At Wigwam, half

way between Arrowhead and Revelstoke, I captured a few mosquitoes which entered the car. A few moths and other insects were taken that evening at the electric lights on the balcony of the C. P. R. Hotel at Revelstoke.

The following morning (August 15) I took the transcontinental eastbound Canadian Pacific train, and thus ended my own collecting so far as British Columbia was concerned. Sunday was spent at Banff, in Alberta, the main station of the beautiful Rocky Mountain Park of Canada, and here I picked up a few insects while out walking. The scenery around Banff reminded me of parts of the Yellowstone Park. Here I met Mr. N. B. Sanson, who is Curator of the Park Museum, and had a most pleasant visit with him.

Dr. Dyar and Mr. Caudell left Kaslo on August 20. They took the lake steamer to Nelson at the foot of the lake; Mr. Caudell going east from that point and leaving British Columbia by the Crow's Nest Pass branch of the Canadian Pacific Railway and securing a few specimens at Nelson and Kootenay Landing.

Dr. Dyar has given me the following account of the remainder of his trip. He went from Nelson to Revelstoke by the Arrow Lakes steamer, collecting a few specimens at Nelson, West Robson, Nakusp and Revelstoke. Thence he went west on the main line of the C. P. R., reaching Vancouver August 23. He left the next day and crossed the water to Victoria on Vancouver Island. Five days were spent here doing a little collecting and visiting several resident entomologists. Mr. A. W. Hanham, Mr. E. M. Anderson and Mr. E. Baynes Reed were met and several pleasant hours spent with them. From Victoria, on the way to Wellington, Dr. Dyar visited Shawnigan Lake, a station on the Esquimalt & Nanaimo Railway. At Wellington, at the end of the railroad, he was entertained by Rev. G. W. Taylor, whose studies of North American Geometridæ are just taking definite shape. Mr. Theo. Bryant was also met here. Dr. Dyar returned to Victoria on September 5, and went back to the mainland the same night. At Vancouver he visited Mr. R. V. Harvey and Mr. A. H. Bush, resident collectors. The same day he started for home by the main line of the C. P. R. On September 7 a stop was made at Glacier in the Selkirk Range, and on September 8 another at Field. A number of moths were picked up at both places although the weather was stormy and cold. On September 10 and 11 a short stop was made at Banff, Alberta, but it was snowing heavily over all the mountain peaks and raining in the town, so practically no insect life was seen.

The material collected on the trip is now in the U. S. National Museum, together with about 500 specimens of Lepidoptera which were given Dr. Dyar for the National Museum by the en-

tomologists who were visited. Rev. G. W. Taylor, especially, gave valuable material, not sparing species that were uniques in his collection.

The paper was illustrated by maps and photographs.

—Dr. Dyar then read the following paper :

NOTES ON THE MOSQUITOES OF BRITISH COLUMBIA.

By HARRISON G. DYAR.

In conjunction with some other work, I made observations on the mosquitoes of British Columbia, Canada, particularly in the Kootenay District, during the past season. This was done in connection with the mosquito work which is being promoted by Dr. Howard, with the help of the Carnegie Institution.

British Columbia is a mountainous region in general, with a fairly abundant rainfall. Nevertheless, towards the middle of summer it becomes generally dry and most natural breeding places for mosquitoes disappear. The mosquitoes, therefore, come early and are soon gone, and are, in the main, composed of those species which develop rapidly and hibernate in the egg state. *Culex pipiens* was not seen anywhere in British Columbia, nor was any species of *Anopheles* met with except in a single instance. The place of *C. pipiens* in rain barrels and other stagnant water is taken by *C. incidens*.

I will mention the species in the order of their comparative abundance. I desire to express my thanks to Mr. Caudell and Mr. Currie for the kind assistance which they rendered me. I am indebted to Mr. Coquillett for patiently examining my 1,238 specimens.

Culex impiger Walker.*

This was by far the commonest mosquito. Early pools in the mountains, filled by the drainage from the melting snow banks, contained the larvæ and pupæ, apparently by the million. Near Kootenay Lake they had all gone in May; but higher in the hills larvæ could still be found till the middle of June, and at Kokanee Mountain, at the foot of the glacier, I found many larvæ on August 10. The adults soon became very common in the woods, though in a few weeks they were much worn and later disap-

* This is the *C. reptans* of my previous papers. Mr. Coquillett will give the differentiation of *impiger* and *reptans* in the new edition of Dr. Howard's "Mosquitoes."

peared, except in the high damp valleys where they persisted longer. Eggs were obtained of the usual spindle shape but shorter and thicker than those of *C. cantans*. They were laid singly and hibernated. The larva closely resembles that of *C. canadensis*, with which it sometimes occurred mixed. It may be distinguished by the larger and coarser ventral brush of the anal segment, composed of longer stemmed tufts and by most of the chitinized parts being black instead of brown.

Culex cantans Meigen.

These mosquitoes became common in the woods in July, gradually disappearing soon after. Eggs were obtained from captured females, laid singly and of the usual elongate fusiform shape, but they all hibernated, none having hatched at the time of writing. Mr. O. A. Johannsen has described the larva. It falls in the synoptic table in the long-tubed group with *C. restuans*, quite an unexpected association, since its other characters are those of the short-tubed larvæ.

Culex reptans Meigen.

This species appeared rather late in the season, no examples being seen till the end of June, after which it became fairly abundant. The flies were persistent in their attacks, alighting and biting at once, without the preliminary deliberations seen in other species of *Culex*. This is the summer mosquito of the Kootenays and lasted longer than any other of the single-brooded species. Eggs were obtained of the usual spindle shape, rather thick and unusually small, laid singly. They have hibernated. The larva was not seen.

Culex canadensis Theobald.

This mosquito was not rare early in the season, but soon disappeared. The larvæ bred in the early pools left by the melting snows, but apparently made no attempt to continue breeding later in the season, as I observed to be the case in New Hampshire. In fact there was no suitable water left for them, and the eggs must all hibernate, making the species single brooded.

Culex incidens Thomson.

This species was at no time abundant, though occasional specimens were met with all the season from May to September. The species breeds continuously, the larvæ hatching from floating boat-shaped masses of eggs as with *C. pipiens*. They could be found at any time in every old water barrel, pump tub, or dug-out spring hole. Also in holes formed by overturned tree-stumps in swampy land, though nature seemed to furnish surprisingly few breeding places for the larvæ. If it were worth while, this

species could be easily greatly reduced in numbers by treating the artificial breeding places. The larvæ closely resemble the mature larva which I have figured as *C. consobrinus* from specimens sent me by Messrs. Dupree and Morgan. They are generally darker, the chitinized parts being usually black, though some occur of a lighter tint, and these I am at present unable to distinguish from *C. consobrinus* by any character whatever.* I bred adults from larvæ found in a fresh-water pool near the sea at Victoria and in a rain-water barrel at Wellington, B. C. Also from pools impregnated with hydrogen sulphide at Banff, Alberta.

Culex punctor Kirby.

This was one of the very early species. A single larva and several pupæ were taken in a pool full of algæ behind a stump in a boggy part of the woods on May 31. The adults were flying at the same time, with the early *C. incidens*, but they disappeared soon. The eggs are spindle shaped, unusually thick and short, diamond-shaped and rather large. They were laid singly and hibernated. The larva falls in the table with *C. sollicitans*, but is differentiated by having the lateral comb of the 8th segment composed of four or five large thorn-shaped teeth instead of a small patch. It is very close to *Culex serratus* as recently described by Smith.†

Culex sylvestris Theobald.

The adults occurred in July in small numbers, mixed with *C. cantans*. No new facts were learned about the life history.

Culex varipalpus Coquillett.

A few adults were taken at altitudes higher than Kootenay Lake. They were fairly common on the summit of a mountain near Bear Lake at an altitude of 7,000 feet, but only a single specimen was taken anywhere else. I owe the discovery of the larva to Mr. J. W. Cockle, who was on the lookout for new wrigglers for me. Mr. Cockle found some larvæ in a pool, mainly *C. incidens* as we learned afterward, and, having no bottle with him, entered an abandoned Chinaman's shack for a vessel in which to bring the larvæ home. There he saw many small wrigglers in an old dirty tin pan which had been filled with water from rain coming through a hole in the roof. With commendable discrimination, he left the *incidens* larvæ and brought

* The young stages of *C. consobrinus* as sent me are quite unlike the corresponding stages of *C. incidens*. But I have not yet bred *C. consobrinus* myself and still feel some doubt about it.

† Ent. News, xiv, p. 309, 1903.

home those from the shack. They proved to be a pure culture of *C. varipalpus*.

The larva most nearly resembles that of *C. atropalpus*, being furnished with long anal appendages and a short breathing tube, while they wriggle slowly at the bottom of their dish, not coming to the surface for a long time. They differ from *C. atropalpus* in that the ventral brush of the last segment is a sessile tuft of hairs like the dorsal one, without barred area. The general habitus of the larva suggests *Wyeomyia smithii*.

Culex territans Walker.

The larvæ were found in permanent pools by the edge of a small lake, showing the normal appearance and habits. The adults made no attempt to bite. Mr. Currie went down to the edge of the lake and secured several by sweeping, but otherwise all those secured were bred.

Culex dyari Coquillett.

This is a very early species and by no means common. On May 29, immediately after my arrival at Kaslo, I found one larva in a slow, cold stream in the woods. It pupated at once; so that even at that date the species had practically ceased breeding. No more larvæ were found and no adults seen.

Culex tarsalis Coquillett.

Two examples only occurred at Kaslo, one having entered my room at the hotel, the other being taken at night while out sugaring for moths. Larvæ were found in a pool of permanent fresh water near the sea at Victoria, B. C. They were mixed with *C. incidens*. The larva belongs to the long-tubed group, with the antennal tuft at the outer third of the joint, the antennæ broadly white banded. It falls in the synoptic table with *C. nigrutilus*,* but the air tube is not so long. The eggs were not observed and may prove to be something unusual.

Culex perturbans Walker.

A single example was taken by Mr. Currie near the little lake. The species was too rare for us to learn anything of its life history.

Culex curriei Coquillett.

Likewise a single example, taken by Mrs. Dyar near Kaslo Creek. This species also was too rare for us to obtain eggs or learn anything of the larva.

*Not the European *nigrutilus*. Mr. Coquillett has proposed a new name for the American species, *culex salinarius*, Ent. News, xv, p. 73, 1904.

Culex spenceri Theobald.

Two captured specimens at Kaslo; one by Mr. Currie June 13, the other by myself June 24.

Culex consobrinus Desvoidy.

One captured specimen, July 3.

Anopheles maculipennis Meigen.

One male specimen taken in the hotel at Revelstoke, possibly brought there on one of the trains. No larvæ were seen.

Aedes fuscus Osten Sacken.

Very scarce. It was only met with in one instance, flying near some pools on a hillside above the lake. Three examples were taken which had come out from the shelter of the bushes to bite.

Corethra velutina Ruthe.

Larvæ occurred in a small pool cut off from the little lake, mixed with *Culex territans*, on which they not improbably fed. The larva has a breathing tube and air bubbles in its enlarged, quadrate thorax, as in the figures of this species from Europe.

Sayomyia trivittata Say.

Larvæ occurred in a neighboring pool to the preceding and even in the little lake itself. The queer, transparent, ghost-like things have been figured by me elsewhere.*

Eucorethra underwoodi Underwood.

The larvæ were found in various pools, principally with *Culex impiger*, but also with *C. incidens*. When the mosquito larvæ were abundant enough to feed them, they generally grew up rapidly and matured in July. In other cases, after they had eaten all the mosquito larvæ from a pool, they lingered till late in the season. At Kaslo they were in the cold pools; at Glacier in similar situations, but at Wellington, B. C., I found them in a rain-water barrel. This species is much more injurious to mosquito larvæ than *Corethra* and *Sayomyia* because of its large size and the fact that it seems to eat nothing else. It has been described by Underwood and Johansen.

Dr. Howard, in commenting upon Dr. Dyar's paper, said it was interesting to compare the number of species (20) found by Dr. Dyar in British Columbia with the number observed by

* Journ. N. Y. Ent. Soc., x, p. 201, 1902.

entomologists in other parts of the country. Mr. Frederick Knab, in the vicinity of Chicopee, Massachusetts, and Mr. O. A. Johannsen at Ithaca, New York, had collected each fourteen species; Miss Isabel McCracken had obtained sixteen species around Palo Alto, California; Messrs. Morgan and Duprée, in Louisiana, had brought together twenty-one species; while Dr. J. B. Smith had listed thirty-three species as occurring in the State of New Jersey, and had bred all but two of them. From these results it is evident that the number of mosquitoes to be found in any one locality is much larger than was formerly imagined.

Mr. Schwarz stated that during his recent stay in Cuba during February and March, he did not find mosquitoes abundant. He tried to collect all the specimens which came to bite him, however, and these represent six different species as determined by Mr. Coquillett. He remarked that the scarcity of mosquitoes in Cuba, in early spring, was in marked contrast to the abundance of one species (*Culex nanus* Coquillett), at Key West, at the same season.

NOVEMBER 18, 1903.

The 181st regular meeting was held at the residence of Mr. J. D. Patten, 2212 R street, N.W. Vice-President Banks occupied the chair, and Messrs. Ashmead, Barber, Benton, Caudell, Dyar, Felt, Gill, Heidemann, Hopkins, Howard, Kotinsky, Patten, Schwarz, J. B. Smith, Summers, Uhler, Warner and Weed, members, and Messrs. Britton, Burgess, Surface, Trainer and Welch, visitors, also present.

—Prof. Uhler spoke informally about the distribution of the Hemiptera in the West Indies. He said that about 700 species were known to him from that region, a great number of these being still undescribed. The character of this fauna is, of course, that of Central America, many of the species being identical with those found in Yucatan and the southern portions of the Central American continent, about five per cent. occurring within the limits of the United States. The real tropical element of this fauna occupies the lowlands, whereas at an altitude

of about 5,000 feet the more temperate life-zone prevails. From what is known of the fauna of Porto Rico, which is represented in the U. S. National Museum by the collection of Mr. August Busck, the island should be included in the group known as the Greater Antilles. It is a notable fact that the fauna of the northern half of this island differs distinctly from that of the southern half.

Mr. Schwarz concurred with Prof. Uhler in his opinion that Porto Rico should be included in the Greater Antilles, and not in the Lesser Antilles, where it has been placed by the Zoological Record. He said that, in referring to the card catalogue of West Indian Coleoptera made by the late Mr. M. L. Linell, he found that Haiti might be considered the central point for the species peculiar to the West Indies. The chain of islands to the southward contains a large proportion of truly Central American and tropical forms whereas the Greater Antilles contain many genera and species found also in our southern States.

Prof. Uhler said he agreed with Mr. Schwarz that the geological formation of the Greater Antilles showed that it was at one time connected with Yucatan as a part of the North American continent.

—Mr. Schwarz presented a paper entitled "A Census of the Collection of West Indian Coleoptera at the U. S. National Museum." Although the National Museum had, he said, never sent an entomological exploration excursion to the West Indies, and had never purchased any West Indian material, yet it had accumulated from various sources, and mainly by the help of the Department of Agriculture, a fair collection of the West Indian Coleoptera. About the time the Riley collection was presented to the Museum, a large part of the collections of the Department of Agriculture and those of Prof. John B. Smith and Mr. M. L. Linell were also turned over to the Museum, but only a few West Indian species were found in the old collection as made up from these sources, and up to 1894 there were only 136 species of West Indian Coleoptera in the National Museum. One important addition was made by the transfer of the H. G. Hubbard collection. Mr. Hubbard visited Jamaica in 1886 and the island of Montserrat in 1894. In Jamaica he collected 172 spe-

cies, a complete set of which was sent for determination to Monsieur August Sallé in Paris. Only a few of them were determined by Sallé and none returned. The Sallé collection has recently been bought by the British government and the material is now in the British Museum. On the island of Montserrat Mr. Hubbard collected about the same number of species, all of them being of small size. A set of these, also, were sent to M. Sallé but hardly any determinations were received from him; nevertheless a complete set of this collection is now preserved in the National Museum.

From 1894 to 1898 the only additions were such as came to the Department of Agriculture by correspondence. It was a notable fact, he said, that although two North American entomologists, namely, Prof. T. D. A. Cockerell and Prof. C. H. Tyler Townsend, occupied official positions in Kingston, Jamaica, the Department of Agriculture received only a few species of Coleoptera from them.

Since the Spanish-American War by far the greatest part of the collection has been added by the parties sent out by the Department of Agriculture for making certain investigations of an economic nature. Most notable among them are the expeditions of Mr. August Busck to Porto Rico and Cuba and of Mr. E. A. Schwarz to Cuba. Two other expeditions, however, made considerable additions to the Museum collection, namely, that of Messrs. Stejneger and Richmond to Porto Rico and that of Messrs. Palmer and Riley to Cuba. The expenses of these two expeditions were defrayed by the appropriation for the Pan-American Exposition.

Mr. Schwarz then presented an enumeration of the material in the Museum, arranged according to the different islands. He referred to the works of Dr. Juan Gundlach on the faunæ of Cuba and Porto Rico, and complained that these works were so little known and so little referred to by entomologists although they contained many original notes on special localities, mode of occurrence and early stages, especially in the Lepidoptera.

As to the insect fauna of the Bahama Islands, Mr. Schwarz referred to the almost entire lack of literature. There is, however, in the National Museum, a small collection of Bahama

Coleoptera made by him while on a visit to the island at the expense of the Department of Agriculture. The subtropical part of Florida must, of course, also be included in the West Indian fauna, and of this fauna there is an almost complete representation in the National Museum, amounting to about 200 species. The total of the West Indian collection of Coleoptera in the National Museum foots up to about 1,160 species. Linell's card catalogue, referred to above, includes 919 West Indian species, and Mr. Schwarz, in completing that catalogue, has brought up the total of described West Indian species to about 2,240—an extremely small number when compared with the 25,000 species described from the Central American continent and the 13,000 species described from North America. The number of species known from the adjacent portions of South America could not then be given.

Mr. Summers stated that he had, several years ago, brought 200 or 300 species of Coleoptera from Grenada, where he was collecting with Mr. Herbert H. Smith. He was not interested in Coleoptera, however, and had put away what he collected. Most of this material had been destroyed by pests since then, unfortunately, but he promised to donate to the Museum what still remained of them. Dr. Hopkins, also, promised to add two or three species to the Grenada fauna in the Museum.

Prof. Smith gave some of his experiences during the time when he was Assistant Curator of the Department of Insects in the Museum, beginning in 1885, and mentioned the material, both in Coleoptera and Lepidoptera, which formed the nuclei of the Museum collections in those orders. He said that most probably a certain number of West Indian specimens which Mr. Schwarz mentioned as a part of the *old* Museum collection came from his private collection and had been purchased by him with the old Schaupp collection. Mr. Schwarz then said that the labels of the specimens referred to by Prof. Smith were in a French handwriting and came very probably from the old Chevrolat collection which contained the material collected by Mr. Felipe Poey.

Mr. Caudell stated that Gundlach's work was not mentioned in the writings of either Scudder or Rehn. Prof. Uhler re-

marked that it was impossible to buy a copy of it; he knew of only two copies in this country, one in New York and the other in Washington. Mr. Ashmead said he had experienced great difficulty in getting access to the works on South American insects by Spanish authors in South America.

—Mr. Caudell read the following paper :

AN ORTHOPTEROUS LEAF-ROLLER.

By A. N. CAUDELL.

Early in July, 1900, while collecting in the vicinity of Washington, D. C., I found a small papaw leaf neatly rolled by some insect. Upon opening it I was surprised to see a very small apterous orthopteron leap actively out, losing itself immediately among the leaves on the ground. On close search I found on the same plant another exactly similarly rolled leaf. Upon peering into this very cautiously I found that it contained a specimen like the one just lost. From an examination of the specimen within the case I could only determine that it was a delicate, pale colored Locustid with very long slender antennæ, apparently a very young specimen. This was preserved, but, not being at that time interested in Orthoptera, I made no notes, nor did I then know that the leaf was rolled by this insect.

On May 22, 1902, Mr. Busck handed me a small jar containing some bits of willow bark and two Locustid nymphs. Upon closely examining the material I found three eggs in a crevice in a piece of bark, two empty, obviously those from which the nymphs had issued, and one shriveled up, evidently destroyed by fungus. The nymphs were identified as those of *Camptotus carolinensis* Gerst. The piece of bark containing these eggs was taken about two feet above ground from a large tree. Placing one of these nymphs in spirits I enclosed the other in a glass tube with some willow leaves covered with plant lice. On examing this tube the following day I found the insect had constructed for itself a pocket in one of the leaves, and then I recognized without doubt the same insect I had taken two years before on papaw. The pocket was made by cutting the leaf through on each side to the midrib and at right angles to it and again one-third of an inch further along the midrib, this time the incision being formed at an angle with it. The flaps thus formed on either side were then folded together and their edges fastened together with silk-like strands, and I have subsequently seen cases with

one end completely closed by a solid mat of this silk. The manner of constructing the pockets or rolls is not uniform. In some cases the incisions are made near the apex of the leaf and then only the two basal cuts are made, the tip of the leaf being folded back, thus making the terminal cuts unnecessary. Sometimes the pocket is formed altogether on one side of the midrib. Mr. Busck luckily observed the formation of one of the pockets and thus describes the process:

“When supplied with fresh leaves the insect at once commenced making a new house, cutting with its mandibles incisions from the edge of the leaf; then, grasping the thus movable edges each with the three legs on each side and forcing them together, it spun what was apparently silk thread from the mouth, fastening the edges together. The whole performance did not take five minutes after it was begun. The insect accurately measured the proper places for the cuts by placing itself on the leaf and realizing how much space was needed. This being determined, the work went rapidly on.”

Within these pockets the nymphs live, coming out mostly at night to feed on plant lice, which seem to form their entire food supply during their early life. In confinement they will eat other insects as Mr. Busck reports a specimen as eating at least one young leaf hopper. In two days one I had under observation ate a dozen large rose aphids, several willow lice and innumerable smaller lice. It increased in length from four to five millimeters in three days. Leaving the city at this point my interesting captive was turned over to Mr. Banks who conscientiously fed and cared for it until the 30th of May, when he unfortunately lost it while attempting to transfer it from one jar to another.

From notes made by Mr. Banks this insect seems to be principally a night prowler. It feeds mostly at night though it will at times feed quite readily during the day. The following notes are taken for the most part from those made by Mr. Banks:

There is apparently no choice in the kind of leaves used for making the rolls. On May 26th it formed one in a honey-suckle leaf. The exact manner of forming the roll, which was on only one side of the midrib, was not noted. On May 27th, after dark, when given some aphids from honey-suckle and maple, its feeding was observed by the light of a lamp. It seized an aphid, bit it, turned it about by means of the palpi, and then proceeded to eat it entirely up, skin and all. Then it walked nervously around, palpi quivering, till it came close to another aphid, which it seized by the back, sucked out the juices and then ate the skin. Seven large aphids were thus eaten in a short time. On May 29th another pocket was formed and the insect appeared on that date to have grown considerably, showing indications of

having molted, though no cast skin could be found. It is quite possible that the insect eats the cast skins of the earlier molts as is done in the case of some other Locustidæ, *Microcentrum* for example.

This spring another attempt was made to rear this species from the egg, but I had to leave for British Columbia and failure resulted. It is to be regretted that the life cycle of this interesting insect could not have been completed, but, since so much is known, it is to be hoped that the near future will see the completion of the life history. Later in life its food habits doubtlessly change, probably becoming essentially vegetarian. Though no adults were secured from these experiments there is practically no doubt of the determination, the generic characters being plainly indicated in the nymph and there being but this one species known from the United States.

Under the name *Camptonotus scudderi* this insect is said by Prof. Uhler* to occur on oak trees about Baltimore in the larval state as early as the first of August, and as adults from the latter part of September until sometime in October. Mature specimens were taken by Mr. Barber on Plummer's Island, Md., on September 10, 1902.

While the nymph of this species has been mentioned by several writers, no reference to its feeding habits has been published so far as I can learn. Riley, in a popular account of the insect on page 186, volume II, of the Standard Natural History, says it hides in a rolled leaf during the day with its long antennæ wrapped several times around the body. It is possible that it is only during the younger stages that it forms these rolls. The young nymphs are very active and run about rapidly. They seldom jump except when disturbed, though capable of leaping a considerable distance.

The egg and first stage nymph of this species may be described as follows:

Egg. Size, 1.25 mm. wide by 4.25 mm. long. Shape round, obtusely pointed at each end; the surface, when seen through a lens, has a regularly beaded appearance. The color of the egg after the insect has issued is pallid with the extremities infuscated, but before hatching they may be colored, probably greenish. The young insect issues through a small trap cut in one end. This door is made by a longitudinal split on one side, which at the lower end intersects at right angles a transverse fracture which extends a fourth of the distance around the egg at about one millimeter from the end.

1st stage nymph. Head long and typically locustian. Eyes oblong, dark brown in color; palpi pale, white at the tips; apical segment of the

* Proc. Ent. Soc. Philadelphia, II, p 549, 1864.

maxillary palpi white on the apical half and brown on the basal half, the whole very slightly longer than the penultimate segment; antennæ situated between the eyes and below the median line; the segments beyond the first, which is twice as long as the second, subequal in length and gradually growing smaller at the tip where the antenna is as fine as a fine hair, the whole antenna brownish in color and covered sparsely with short microscopic hairs. The entire insect is of a very light brown below, almost white, growing darker above, almost fuscous dorsally on the meso- and metanota which are both visible behind the medium sized quadrate prothorax. This latter is scarcely as wide as the head, truncate anteriorly and broadly rounded posteriorly with weakly-developed lateral lobes. The abdomen, which is slightly pyriform, shows ten dorsal segments, the terminal one scarcely visible between the bases of the divergent cerci. The legs are pale brownish, paler beneath and with pallid geniculations. The tarsi are also pallid. Anal cerci flesh colored, scarcely as long as the last three abdominal segments.

Length of body, from front of head to the tip of the abdomen, 4 mm.; of antennæ, 20 mm.; hind femora, 2 mm.

Mr. Caudell was asked whether he considered the orthopteron a true silk-spinning insect, and he replied that he thought the material used in fastening the roll might be simply dried saliva. Mr. Banks said he thought the spinning material might properly be called silk. Dr. Howard suggested that fresh specimens should be dissected to see whether there were true spinning organs. Prof. Uhler stated that he had collected this insect near Baltimore by beating it from trees.

—Mr. Kotinsky showed specimens of a scale-insect (*Lecanium hemisphericum* Targ.), which were found on a plant sent in to the Department of Agriculture. Curiously enough some of them, during transit, had transferred and fastened themselves to the dryers in which the plants were pressed and had there laid eggs.

—Mr. Caudell exhibited specimens of a West Indian cricket (*Anurogryllus antillarum* Saussure). This insect is injurious to various crops in the South, where it has been known for many years, although it has never been referred to in print nor listed as belonging to our fauna.

—Mr. Barber exhibited specimens of the rare and curious neuropteroid insect, *Merope tuber* Newman, collected the past summer at Plummer's Island, Maryland, and presented the following note:

THE OCCURRENCE OF THE EARWIG-FLY, *MEROPE*
TUBER NEWMAN.

(NEUROPTERA, PANORPIDÆ.)

By HERBERT S. BARBER.

There is, perhaps, no more interesting species among North American Neuropteroid insects than this singular Panorpid. Its great rarity, together with the fact that its habits are entirely unknown, may make the present records interesting to some. It is hoped that more data may be obtained the coming season.

Newman's type of the species, a female, was found by Doubleday at Trenton Falls, N. Y., in 1837. Sixteen years later, July 16, 1853, Dr. Asa Fitch captured a female, which had been attracted by the light of his candle, at Salem, N. Y. This specimen is preserved in the U. S. National Museum. Hagen, in his "Synopsis of the Neuroptera of North America," published in 1861, gives two localities—Berkeley Springs, Virginia* (Osten Sacken †), and Pennsylvania. On July 28, 1871, Dr. Fitch found his second specimen, a male, "Running on papers on office table, evening, having entered at the open door, probably."‡ He published a very full account and description of the species in his fourteenth report,§ but seems not to have known of Hagen's paper. He captured his third and last specimen, a female, on August 24, 1877, and says of it: "Same as preceding, and making short flights in the lamplight."|| Fitch's second and third captures appear to be lost.

On August 22, 1886, Mr. E. A. Schwarz found a male specimen, as published in the columns of our Proceedings,¶ under a stone in what is now the Zoological Park of this city. Late in the summer of 1898 Mr. O. F. Cook found a female specimen near Mt. Vernon, Va., also under a stone, and a few years ago Mr. Nathan Banks captured a female at light, at Falls Church, Va. Hine, in his Review of the Panorpidæ of America, north of Mexico,** adds Orono, Me.,†† to the habitat, but gives no further data.

* Now West Virginia.

† Osten Sacken's specimen was collected on the wall of the hotel veranda by lamplight one evening in the summer of 1856. See "Record of My Life Work in Entomology," by C. R. Osten Sacken, Cambridge, Mass., October, 1903.

‡ Fitch's note-book.

§ 14th Rept. Ent. N. Y. State Agr. Soc., pp. 373-381, 1872.

|| Fitch's note-book.

¶ Proc. Ent. Soc. Wash., 1, p. 55, 1888.

** Bull. Ohio State Univ., Ser. v, No. 7, Feb., 1901.

†† Mr. Samuel Henshaw writes me that this specimen was collected by Prof. C. H. Fernald,

Last summer the following specimens were taken in this vicinity—all at light except one—which evidently *had* come to light the previous evening: Mr. Schwarz captured a male on Plummer's Island, Md., on June 19. Mr. Busck took one male and two females, and saw a fourth example—all within three or four minutes of each other—on Plummer's Island, September 9, about 10 o'clock in the evening. He found another female at the same place about 7 P. M. on September 11, and still another female, dead but still soft, in his house at Langdon, D. C., September 18, 1903.

We now have records, therefore, of sixteen specimens—seven in the National Museum Collection; two in Mr. Bank's Collection; one, the type, in the British Museum; three in the collection of the Museum of Comparative Zoology at Cambridge, Mass.; one in Mr. Cook's Collection and, lastly, the two missing specimens from the Fitch Collection.

—The following article was presented for publication:

"THE GENERA OF THE DIPTEROUS FAMILY EMPIDIDÆ."

(ADDENDA.)

By D. W. COQUILLET.

In the paper under the above heading, which appeared on pages 245 to 272 of Volume V of these Proceedings, it was stated several times that the writer had been unable to consult a copy of Macquart's "*Insectes Diptères du Nord de la France*," separate edition. This work has recently been obtained for the library of the U. S. Department of Agriculture by the efficient Librarian, Miss Josephine A. Clark, and I am thus enabled to make the following supplementary remarks and corrections to the article in question:

Page 246, under *Ardoptera*. Macquart mentioned only the one species given in his later work.

Page 249, under *Elaphropeza*. Only the single species was mentioned.

Page 252, *Leptopeza* should be *Lemtopeza*; only the one species was mentioned by Macquart.

Page 253, under *Microphorus*. Three species were described, the second being *velutinus*.

Page 255, under *Platypalpus*. Eighteen species were described, of which *cursitans* was the fourteenth.

The data given in my paper in regard to this separate edition were chiefly derived from Macquart's later works; several of these

references are erroneous and have been corrected in the errata inserted at the end of the volume in which the paper appeared.

I may add that Dr. M. Bezzi, of Sondrio, Italy, writes me that *Holoclera* is a synonym of *Macrostomus*, and that the type species of the former is a synonym of *Rhamphomyia umbripennis* Meigen.

—Mr. Welsh, who was then introduced to the Society by Dr. Howard, exhibited a large Cerambycid beetle, *Macrotoma luzonum* Fabricius, and a carpenter bee taken by him in the Philippine Islands. Mr. Ashmead identified the carpenter bee as *Xylocopa bombiformis* Smith, a species in which the males have until recently been unknown, being of quite different aspect from the females. The females are bluish black and the males yellowish green.

DECEMBER 3, 1903.

The 182d regular meeting was held at the residence of Dr. Wm. H. Ashmead, 1807 Belmont avenue, N.W., Vice-President Banks in the chair, and Messrs. Ashmead, Barber, Benton, Currie, Dyar, Gill, Heidemann, Hopkins, Kotinsky, Patten, Quaintance, Schwarz, Titus, Ulke, Warner and Webb, members, and Mr. W. M. Scott, visitor, also present.

Mr. C. Schæffer, of the Museum, Eastern Parkway, Brooklyn, N. Y., was elected a corresponding member, and Messrs. W. F. Fiske and A. W. Morrill, of the Division of Entomology, U. S. Department of Agriculture; Mr. W. M. Scott, of the Division of Vegetable Pathology, U. S. Department of Agriculture, and Prof. C. V. Piper, of the Division of Agrostology, U. S. Department of Agriculture, active members.

The officers of the Society during 1903,* were re-elected for

* President, Mr. D. W. Coquillett; First Vice-President, Mr. Nathan Banks; Second Vice-President, Dr. A. D. Hopkins; Recording Secretary, Mr. Rolla P. Currie; Corresponding Secretary, Mr. Frank Benton; Treasurer, Mr. J. D. Patten; Additional members of the Executive Committee: Dr. H. G. Dyar, Dr. L. O. Howard and Mr. C. L. Marlatt. Publication Committee: Mr. Rolla P. Currie, Dr. H. G. Dyar, Mr. E. A. Schwarz, Dr. L. O. Howard and Dr. Wm. H. Ashmead.

the year 1904. Upon motion by the Society to increase the membership of the Publication Committee, the Chair appointed, in addition to the present members, Mr. D. W. Coquillett and Mr. Otto Heidemann.

In the absence of Mr. Coquillett the annual address of the President was then read by the Recording Secretary.

ANNUAL ADDRESS OF THE PRESIDENT.

A BRIEF HISTORY OF NORTH AMERICAN DIPTEROLOGY.

By D. W. COQUILLETT.

In searching for a topic that promised to be of some interest to the members of this Society, it occurred to me that perhaps a brief history of the science of Dipterology as it applies to this country might not be wholly devoid of interest, the more so as nothing of this kind has been attempted within recent years.

In so far as this science affects our fauna, it had its inception in the year 1763; in that year the immortal Linné described a single Dipteron from Pennsylvania under the name of *Asilus æstuans*, a species now placed in the genus *Erax*. Not only was it the first member of this order from our fauna to be honored with a name and description, but it also enjoys the distinction of being the first Dipteron described from any country outside of Europe.

The time extending from the year above mentioned down to the present may be conveniently divided into three epochs. The first of these was terminated by the advent of the first published description of a North American Dipteron by an American author; this occurred in the year 1817, when the equally immortal Thomas Say published a description of a single new species of Diptera, likewise from Pennsylvania, under the name of *Diopsis brevicornis*, for which he later erected the new genus *Sphyracephala*. This first epoch, covering a period of 54 years, witnessed an even dozen foreign writers describe new forms of Diptera from the United States. Among these are such noted authors as Linné, Fabricius, De Geer, Drury and Olivier.

The second epoch comprises the time from the appearance of

this first paper by Say to the advent of a distinctively American Dipterologist in the person of Dr. S. W. Williston, whose initial descriptive paper appeared in the year 1880 and contained descriptions of three new species—*Rhynchocephalus sackenii*, *Silvius pollinosus* and *Chrysops discalis*—all of them inhabitants of the western half of this country. During this second epoch, which covered a period of 63 years, no less than 40 different authors published descriptions of new forms of Diptera from the United States. Of this number, fifteen, or more than one-third of the whole, were Americans. In making this calculation I have included those who, although of foreign birth, have taken up their residence among us and remained here during the balance of their natural lives. Of this latter number are B. D. Walsh and Dr. H. A. Hagen, both of whom, during the latter part of their lives, were essentially citizens of this country. Students of all the orders, but more particularly those engaged in the study of our Diptera, could wish to include Baron Osten Sacken in this category; his long residence among us, his active interest in all branches of entomology, but especially in our Diptera—as is evidenced not only by his published writings, but also by the presence in this country, within easy reach of our students, of the collection containing the type specimens of the species described by Dr. H. Loew and himself, for which we are indebted to his careful foresight and unremitting efforts in our behalf—have combined to give to that distinguished Dipterologist a place among us not enjoyed by any other citizen of other lands.

While, during this second epoch, our Dipterological literature has been enriched by contributions from the pens of such masters as Say, Wiedemann, Schiner, Osten Sacken and Loew, we have also been inflicted by such indifferent workers as Desvoidy, Bigot and Walker. Among the Dipterologists of this period who have completed their earthly careers, the name of J. R. Schiner, of Austria, must be accorded a very exalted place; not only did he possess in a marked degree the faculty of discerning the most striking differences existing between the different objects which he described, but he also had the happy faculty of expressing them in words that admitted of no misunderstanding of the idea he intended to convey, while his conscientiousness was

apparent in all of his acts. On the other hand, at the very bottom of the list, one would be inclined to place the ubiquitous Robineau-Desvoidy; while his larger groups show some approach to a natural arrangement, his conception of a genus and species and his futile attempts at describing them, are as unsatisfactory as they well could be, and it is therefore not at all surprising that Rondani (a genius in his way, as is more particularly evidenced by his masterly treatment of the family Anthomyidæ, one of the most obscure and difficult groups in the whole order), after recording the names of several of Desvoidy's supposed species as synonyms of some well-known form, not infrequently placed a suggestive "etc." after the last one, indicating that several more names from the same source could be added *ad libitum*.

Wiedemann, who was a contemporary of Say, was the first writer to pollute our nomenclature of the Diptera by changing several of the valid specific names imposed by Say; sometimes this pollution was simply a matter of one or two letters, at other times the entire name was changed for no other apparent reason than that the new one was more descriptive of the species than was the original. Loew followed Wiedemann in this unfortunate respect, and, being a more prolific writer, the mischief which he wrought was correspondingly greater. Unfortunately, these polluted names have been given the place of the valid ones in Osten Sacken's otherwise excellent catalogue of our Diptera, and later writers, with few exceptions, have followed the catalogue as a matter of expediency.

This polluting of the nomenclature comes down to us from the very beginning of our binomial system. It was the custom of Linné, in the subsequent editions of his works, to occasionally change the names which he had previously bestowed upon certain species, sometimes simply changing the manner of spelling, but at other times an entirely different name was substituted, and in rare cases the old name was transferred to a totally different species. Considering the fact that he wrote at a time when science was just beginning to free itself from fiction, his actions can perhaps be condoned; but at the present time there would appear to be no excuse either for polluting the valid names imposed by the original describers or for using such polluted names

in preference to the valid ones. The name of the genus or species as imposed by its first describer is a matter of much historic and scientific moment; what any person's opinion is as to what the name ought to have been is a matter of no importance, and belongs rather to the realm of fiction than to pure science. Students in this country almost without exception are agreed that only in the case of preoccupation is there a valid excuse for changing the name of a genus or species, and then, in the case of a genus, the name to be changed must be identical—letter for letter—with the earlier name.

Shortly after the advent of Dr. Williston upon the scene, quite a number of our students began to seriously study our Diptera and to record the result of their studies in our various journals and other publications; in fact, nearly all that has been published on our species within recent years has been the work of our own students. This is certain to result in a better understanding of these insects than was possible under the old regime, since it must be apparent to all that the student who studies his subjects in the field as well as in the laboratory, and who is in a position to collect the specimens in large numbers, will obtain a more correct idea of the limits of a species and is also in a position to more accurately interpret the older descriptions which relate to his fauna, than any student in a distant land. This latter fact is clearly set forth in a comparison of two monographs which deal with our Diptera, the one written by Doctor Loew, an author who had never even visited our shores, the other by Doctor Williston, who was born and brought up among the objects of which he wrote. In the first work, a "Monograph of the Dolichopodidæ," of the 60 descriptions of species from the United States published by previous authors, only 8, or less than one-seventh of the entire number, were recognized by Loew, while the remaining species he described as new. There is, of course, no grounds for doubting the fact that a large proportion of the latter are identical with those described by the older authors, and consequently these species have ever since been sailing under false colors, while their valid names have been permitted to encumber our lists as a useless, meaningless mass, and thus they must remain until some conscientious student from this country again gives this family a careful revision, as a result of which a large per-

centage of these old names will be restored to their rightful places. In strong contrast to this makeshift and unsatisfactory method is the result obtained by Doctor Williston, as indicated in his "Synopsis of the North American Syrphidæ;" of the 223 descriptions of species from the United States, to the type specimens of which he did not have access, he succeeded in identifying 170, or more than three-fourths of the whole number, as compared to less than one-seventh, in the case of Dr. Loew. After due allowances are made, the result is very much in favor of the man upon the ground.

There is an unfortunate tendency, particularly among new recruits, to describe at once as new all forms that do not agree in all respects with existing descriptions as they interpret them. The identifying of species from published descriptions is always attended with a certain degree of uncertainty, and unless one has access to representatives of all the species described in a given group it is advisable to label the specimen with the name of the species with the description of which it most nearly agrees, placing a question mark before the specific name. It is only when one has access to practically all the forms occurring in a given region that he is in a position to correctly interpret the published descriptions of species from that region. In several cases the descriptions contain actual misstatements—a fact that should not be overlooked when identifying species from descriptions only.

The present epoch has also witnessed a notable advance in our knowledge of the early stages of at least a portion of our Diptera; this was inaugurated by Dr. L. O. Howard in his studies of our mosquitoes, a work in which he has been ably seconded by the patient labors of Dr. H. G. Dyar, Dr. J. B. Smith, Prof. O. A. Johannsen, and a few others. Dr. Dyar has described and figured the early stages of nearly every kind of mosquito that has come within his reach, while Dr. Smith informs me that during the last two seasons he has obtained the early stages of 31 of the 33 species known to inhabit New Jersey—a remarkable achievement, indicative of what may be accomplished in other groups by continuous, well-directed efforts. In the list of the insects of New Jersey, published only three years ago, only ten

species of Culicidæ were credited to that State—less than one-third of the number now known to occur there.

This increased interest in the early stages of our Diptera is certain to result in a better understanding of these insects; no matter how expert a student may become in separating the adults into their proper species, it is not until we obtain a knowledge of all of the early stages of any given form that its status as a species becomes fully established, and it is to be hoped that investigations in this direction will be continued until the early stages of every Dipteran in our fauna has been made known.

The presidential address was favorably commented upon by Messrs. Ulke, Kotinsky, Ashmead, Schwarz, Gill and others. Mr. Ulke stated that he was indebted to Dr. Loew for his first knowledge of real insect collecting, the latter having, some seventy years ago, visited his father's home, in Germany, and shown him the method of using the various implements employed in insect collecting. Dr. Gill said that he agreed with Mr. Coquillett that a generic name should be considered as preoccupied only when the previously proposed name agreed with it exactly, *letter for letter*. He remarked, however, that many, perhaps the majority, of systematists would take issue with him on this point.

—Dr. Hopkins read a paper entitled “Notes on the Scolytidæ of the Fitch Collection,” and exhibited specimens from the Fitch collection in the National Museum. He referred to the notebooks examined by him in the library of the Boston Society of Natural History, and called attention to Fitch's method of numbering and labeling specimens. The collection represents twenty-four species, including five which are still undescribed. The species were identified and arranged by Dr. Hopkins, in his paper, according to his manuscript Synopsis and Check-List of the Scolytidæ of America north of Mexico. He thought best, therefore, to withhold the paper from publication until the synopsis shall have been published.

Mr. Ulke said that he saw Fitch some fifty years ago. The reason there were so many wrongly named Coleoptera in the Fitch collection was because Fitch had been unable to secure any help from coleopterists. Fitch told him that he had written repeatedly

to Dr. LeConte asking his co-operation in determining the species in his collection, but had received no reply. He, therefore, worked almost entirely unaided, gave names to such species as he could identify, and labelled all others with his own manuscript names.

Mr. Schwarz stated that there were various things concerning Fitch's collection and Fitch's types, which seem to be unknown to many of our younger entomologists. He more especially referred to the insects sold by Dr. Fitch to the New York State Agricultural Society and which are now in the New State Museum at Albany. This collection probably does not contain any type specimens whatever. What is a type in the Fitch collection can only be ascertained by consulting Fitch's note-books. Six of these note-books, with the corresponding boxes of the original Fitch collection, were bought many years ago by the U. S. Department of Agriculture and are now in the U. S. National Museum. The record of the types, as given by Dr. Riley in Lintner's paper on the Fitch collection,* is correct. The remaining note-books of Fitch became separated from the Fitch collection, and some of them are now in the possession of the Boston Society of Natural History. The others seem to be lost. The remnant of the Fitch collection of insects was finally purchased by the Department of Agriculture, but proved to be in a very deplorable state of preservation.

The subject of Fitch's types, and types in general, was further discussed by Messrs. Ashmead, Hopkins, Titus, Schwarz, Dyar and Banks.

—Dr. Dyar handed the following articles to the Secretary for publication :

**A NEW VARIETY OF THE NOCTUID EXYRA
SEMICROCEA GUENÉE.**

(Exyra semicrocea, variety hubbardiana, n. var.)

By HARRISON G. DYAR.

The usual form of *semicrocea* has the outer half of the fore wings solidly blackish. In *hubbardiana* this color is largely

* Ninth Rept. N. Y. State Ent. for the year 1892, pp. 411-413, 1893.

faded out and lost, leaving a broad dark band, representing the inner edge of the usual patch and a subterminal band, the latter situated in a broad, light grayish field, which extends to the margin and touches the median band centrally. Two males, De Funiak Springs, Florida (H. G. Hubbard), bred on *Sarracenia flava*, mixed with normal *semicrocea* and with *E. ridingsii* Riley.

Type.—No. 7335, U. S. National Museum.

A NEW GENUS AND SPECIES OF TORTRICIDÆ.

By HARRISON G. DYAR.

Gymnandrosoma, new genus.

Palpi rather long, obliquely ascending, second joint only slightly widened by scales, third distinct, rounded; ♂ antennæ compressed, minutely bristled, subserrate; wings broad, costa arched, without fold in the ♂, veins all separate; vein 2 of the fore wings from near the middle of the cell, 3 and 4 approximate at base, 5 more distant, 7 to outer margin, 8 to costa, separate; hind wings with 3 and 4 connate, 5 remote, nearly parallel to 4, 6 and 7 closely approximated at base. Thorax with a double truncate tuft behind; abdomen in the ♂ with the basal segments of dorsum bare of scales, a pair of pencils of yellowish hair arising from the tip of the second segment. Inner margin of hind wings excavated below into a large pocket which covers the abdominal hair pencil when the wings are closed.

Allied to *Pseudogalleria* and *Ecdytolopha*, but differing in the peculiar position of the ♂ scent tuft, which is on the abdomen instead of in a fold of the wing.

Gymnandrosoma punctidiscanum, new species.

Wings roughly scaled, strigose, dark gray from blackish scales heavily overlaid on a pale ground, nearly solidly so over the basal two-thirds, sometimes over the whole wing, but usually leaving the terminal third largely light. A round, punctiform, whitish discal dot, in the males situated nearly at the edge of the dark basal area which is curved inward below the cell. A more or less distinct, maculate, broken submarginal band, composed of dark patches with darker edges. Hind wings blackish brown.

Expanse ♂ 18–19 mm., ♀ 21–25 mm.

Described from two males and three females, Washington, D. C., May (L. O. Howard), New Brighton, Pa., June 2, Aug. 25 (H. D. Merrick), Newark, N. J., June 11 (W. D. Kearfott), Long Island, N. Y.

U. S. National Museum, type No. 7658.

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OF THE
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OF
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VOL. VI.

APRIL, 1904.

No. 2.

JANUARY 14, 1904.

The 183d regular meeting was held at the residence of Dr. L. O. Howard, 2026 Hillyer Place, N. W. Vice-President Hopkins in the chair, and Messrs. Ashmead, Barber, Benton, Burke, Busck, Caudell, Currie, Dyar, Fiske, Gill, Hinds, Howard, Marlatt, Morrill, Morris, Patten, Quaintance, Scott, Titus, Warner and Webb, members, and Messrs. A. Arsene Girault and J. F. Strauss, visitors, present.

Dr. Wm. H. Ashmead was re-elected to represent the Entomological Society in the Washington Academy of Sciences.

—Dr. Howard passed around for examination Volume II, the concluding volume, of Newstead's Monograph of the British Coccidæ, recently issued by the Ray Society. He drew attention to the fine quality of the illustrations, stating that in his opinion they were the best illustrations of Coccidæ that have yet been published. The majority of the species treated are, he said, cosmopolitan. Of thirty-six species treated in Volume I, probably only three are indigenous to Great Britain. Of especial interest are the descriptions of the ♂♂ in the genus *Lecanium* and particularly of the ♂ of *L. hesperidum* which has not been described before. Newstead describes the ♂ of this species, in the puparium only, from specimens sent him from Bath, England. Mr. Albert Koebele, in his correspondence with the De-

partment of Agriculture while in Australia in quest of predaceous enemies of scale insects, stated that there the ♂♂ of *Lecanium hesperidum* were as abundant as the ♀♀, but he apparently failed to send in any specimens.

—Dr. Ashmead exhibited specimens of a peculiar leaf-sewing ant (*Æcophylla smaragdina* Fabricius) from the Philippines, together with examples of its work. The method by which the leaves are sewed together is most remarkable. The worker ants hold their own larvæ in their jaws while these spin a fine thread that holds the edges of the leaves together. Dr. Ashmead commented on the structural peculiarities of the species.

—Dr. Dyar presented for publication the following papers:

ADDITIONS TO THE LIST OF NORTH AMERICAN LEPIDOPTERA, NO. 1.

BY HARRISON G. DYAR.

The following are a few new species that have come to notice together with some species here first recorded as belonging to our region.

Family NOCTUIDÆ.

***Tornacontia mediatrix*, n. sp.**

Head dark brown, thorax white, a broad tip to the collar and a pair of dots on posterior disk brown-black. Fore wings white, basal space shaded with pale leaden gray to beyond t.-a. line, which is white and twice angled in one specimen, lost in the other and represented only by the gray shade beyond it. A quadrate purplish black patch on the center of inner margin reaching to median vein, narrowly separated by a white line from a broad, leaden gray band which runs to costa before apex. Two gray spots on costa at points of inception of the obsolete median and t.-p. lines. Orbicular a black dot; reniform a broken black ringlet; a small gray patch at apex; a terminal row of black dashes; fringe gray at anal angle and above middle of outer margin. Hind wings white, brownish outwardly. Expanse 24 to 25 mm.

Eight specimens, ♂ and ♀, Huachuca Mts., Arizona (Osler), Las Vegas Hot Springs, New Mexico (Schwarz and Barber).

Type.—No. 7686, U. S. National Museum.

The species of *Tornacontia*, at present described, may be separated as follows:

Head and thorax white.

Fore wings with white space below orbicular followed by a blackish patch.

Hind wings all brownish *sutrix* Grote.

Hind wings nearly all white..... *altera* Smith.

Fore wings largely leaden gray..... *megocula* Smith.

Head blackish, collar black tipped.

Fore wing with white space below orbicular followed by a quadrate blackish patch *mediatrix* Dyar.

Fore wing without discoloured dark patch..... *tripartita* Smith.

***Acontia ceyvestensis*, n. var.**

Similar to *aprica* Hübner, but smaller and the head and thorax white. Three examples are marked like *aprica* Hübner on the wings, two others like *biplaga* Guenée. Expanse 20 to 24 mm.

Five specimens, Key West, Fla.

Type.—No. 7687, U. S. National Museum.

I conclude that *aprica* and *biplaga* are varieties of one species, although Smith has recorded the contrary opinion.* Indeed a series of 40 specimens before me shows the two forms to intergrade. One of the specimens from Texas (form *aprica*) has only a little of the dark color left on the vertex of head and thus closely approaches the local race *ceyvestensis*.

***Oncocnemis laticosta*, n. sp.**

Thorax blackish, variegated with pale ochereous scales, collar largely of the pale color; abdomen light. Fore wings pale ochereous in ground color, the inner two-thirds of wing heavily overlaid with blackish, powdery, not obscuring the marks. Lines as in *melalutea* Smith, black, edged with pale, crenulate; basal line obsolete, t.-a. slightly arcuate, t.-p. bent out beyond cell with white points on veins 2 and 4. Terminal space dark shaded, enclosing the pale, broken, irregular subterminal line. Ordinary spots pale ochereous, filled by a darker shade; orbicular elongate, claviform punctiform, nearly obsolete. A row of terminal black dashes outlined by narrow pale arcs. Fringe brown, cut by white, interlined in gray. Hind wings white, a smoky narrow outer border, fringe white. Expanse 30 mm.

Five specimens, Jerome, Arizona (Osler).

Type.—No. 7688, U. S. National Museum.

Nearly allied to *melalutea* Smith, but differing in the more diversified color, the contrasting pale tint of costal area, the elongate orbicular and the whiter, more narrowly bordered hind wings.

* Trans. Am. Ent. Soc., xxvii, p. 69, 1900.

Oncocnemis tetrops, n. sp.

Head and thorax gray with black scales, collar with white scales before and a black line, abdomen light gray. Fore wings dark gray, terminal third uniformly blackish, crossed only by the blacker veins; costal area lightened by whitish streaks. Orbicular and reniform black centered, white ringed, orbicular elliptical, reniform cut in two by the centering black line which touches the end of the orbicular; median vein black with a narrow white edge above. There is a black basal dash that apparently joins the claviform as in *chandleri* Grote, but this part of the wing is rubbed. Hind wings whitish with a diffuse outer border of pale smoky, a dark broken terminal line; fringe white. Expanse 30 mm.

Five specimens, Jerome, Arizona (Oslar).

Type.—No. 7689, U. S. National Museum.

Near *chandleri* Grote, *colorado* Smith and *oblita* Grote, but the subterminal line is wholly lost.

Copablepharon sanctæ monicæ, n. sp.

Thorax and fore wings pale ochereous, the thorax before a shade darker; abdomen whitish at base, else brown. A black point on median vein and on vein 1 represent t.-a. line; a cluster of black and brown scales at origin of veins 3-4; t.-p. line a row of eight elongate black dots; fringe pale. Hind wings whitish on inner margin and fringe, disk largely shaded with deep brown; an outer row of elongate black dots on the veins. Expanse 36 mm.

Two ♂♂, Santa Monica, California (J. J. Rivers).

Type.—No. 7690, U. S. National Museum.

Family NOTODONTIDÆ.

Afilia oslari, n. sp.

Fore wings with veins 6 to 10 stalked, hind wings with 6 and 7 stalked; otherwise agreeing in structure with the type of the genus. Head and thorax dark gray, abdomen ochraceous. Fore wings narrow, gray, basal line obscure, lost in the more or less black powdering that fills the basal space. Lines geminate, approximate, black, slightly ochraceous filled, a little crenulate or angled, not strong. A curved, lunate, black discal dash. Subterminal line smoky, diffuse, black, tending to be broken on the veins. A series of terminal oblique intravenular dashes; a black line at base of fringe. Hind wings white. Expanse 30 to 32 mm.

Four specimens, ♂♂, Nogales, Arizona (Oslar); Guadalajara, Mexico (Neumøgen).

Type.—No. 7691, U. S. National Museum.

Notela jaliscana Schaus.

Ten specimens, Nogales and Huachuca Mts., Arizona (Oslar). The Nogales specimens all lack the black longitudinal stripe, while the others all have it. I do not think this more than varietal. Mr. Schaus mentions its presence or absence in his description.

Pseudhapigia brunnea Schaus.

Four specimens from Mr. Oslar, taken in Nogales and Tucson, Arizona. Only two species are known in this genus, and it may be that the form before me is new, as it does not tally in all respects with the descriptions of *brunnea* Schaus or *xolotl* Schaus. But I have no authentic specimens of these species before me. In my specimens the color is a warm red-brown.

Family MEGALOPYGIDÆ.

Archylus tener Druce.

Mr. E. J. Oslar has sent me a ♂ specimen, taken in southern Arizona. It is, apparently, referable to the Megalopygidæ, though the structure is unusual as there is no branch to vein 1 on the fore wings, while veins 7 and 8 of hind wings are united to well beyond the end of the cell, arising from a stalk from its upper angle. The appearance of the insect is well shown in the figure in the *Biologia Centrali-Americana*, pl. 79, fig. 6.

It may remain for the present in the genus *Archylus* Walker, though not agreeing entirely. The type of *Archylus* is *guttifascia* Walker, which, as Sir G. F. Hampson kindly informs me, is a Megalopygid much like *tener*, but vein 8 of the hind wings arises just before angle of the cell while the cell is short. These differences are probably of generic value, but I will only call attention to them now.

NOTE ON THE LARVA OF AN HAWAIIAN PYRALID.

(*Omiodes accepta* Butler).

By HARRISON G. DYAR.

Mr. D. L. Van Dine, of the U. S. Dept. of Agriculture's Experiment Station at Honolulu, Hawaiian Islands, has sent me larvæ of *Omiodes accepta*, collected from young sugar cane at the Niulii Plantation, Kohala, Island of Hawaii.

Larva. Head rounded, slightly bilobed, green, checkered with angular faint luteous spots; a black spot below seta ii, a little oblique dash above

paraclypeus, eyes and jaws black. Body slender, cylindrical; subequal; the segments coarsely 3-annulate. Uniform green, the dorsal vessel edged by a more or less distinct opaque white fat body. Tubercles moderate, concolorous, iv + v normal, on the thorax ia + ib, iia + iib; setæ rather large, pale. Feet normal, the crochets in a circle narrowly broken without. Cervical shield concolorous, two small black dots at its lateral margin; a blackish line below tubercle iia + iib on joint 3. Spiracles concolorous; all feet pale.

—Dr. Ashmead exhibited proof sheets and illustrations of his forthcoming classification of the Superfamily Chalcidoidea, commenting on many of the strange and interesting species figured. In reply to a question as to the number of species of Chalcid-flies, he stated that he believes that there are between 3,000,000 and 4,000,000 species of Chalcidoidea in the world.

—Dr. Hinds and Prof. Quaintance were asked to give the Society an informal account of the Cotton-boll Weevil (*Anthonomus grandis*) and the Boll-worm, with their experiences and the results of their recent investigations on these pests. Dr. Hinds gave the life-history of the Cotton-boll Weevil and told of some of the measures that are being taken to prevent its spread and undue multiplication. Prof. Quaintance spoke further on the same subject and also alluded to the present status of the Boll-worm (*Heliothis armiger*) in Texas and other cotton-growing States. Prof. Quaintance said that the record of the largest number of eggs laid by a single moth of the Boll-worm had been raised, as a result of his observations, from 600 to 2,200. Dr. Dyar was asked as to the number of eggs laid by allied Noctuidæ. He replied that he did not know whether there were any records as high as that, but that he knew of an Arctian that lays as many as 2,200 eggs.

FEBRUARY 4, 1904.

The 184th regular meeting was held at the residence of Mr. Otto Heidemann, 700 Newark street, N. W. In the absence of the President and both Vice-Presidents, Dr. Howard was elected Chairman *pro tem.*, and there were present Messrs. Ashmead,

Barber, Benton, Burke, Busck, Caudell, Currie, Gill, Heide-mann, Hinds, Kotinsky, Morrill, Morris, Patten, Piper, Titus, Warner and Webb, members, and Dr. J. R. Sheldon, visitor.

Under miscellaneous business a vote was taken on the amendments to Article VII of the Constitution, proposed by the Executive Committee at the December meeting. The amendments were adopted and the Article as amended now reads as follows :

SECTION 1. The initiation fee of active members shall be one dollar; the annual fee three dollars, payable at each annual meeting after election. Any active member in arrears for one year may, after one month's notification, be dropped from the rolls. No member in arrears shall be entitled to vote.

SECTION 2. Corresponding members shall pay no initiation fee, but shall pay an annual fee of two dollars, payable at election and at each annual meeting thereafter. Any corresponding member in arrears for one year may, after notification, be dropped from the rolls.

SECTION 3. Members elected within three months previous to an annual meeting shall not be required to pay an annual fee for the year in which they are elected.

—Mr. Kotinsky exhibited an abnormal specimen of *Culex pipiens*. It was received with a collection of Central American mosquitoes. The abdomen of the specimen is much distended but seems to contain nothing except the ovaries and the eggs. Mr. Caudell stated that in Mr. Pergande's notes on mosquitoes reared at the Department of Agriculture there are a number of references to specimens with similarly inflated abdomen. Mr. Kotinsky said that the condition of the abdomen of the mosquito was much the same as that of the abdomen of house flies that have become affected by fungus growth. Mr. Morris said that while he was at Lansing, Michigan, summer before last, he was invited by the entomologist there, Mr. R. H. Pettit, to examine some fungus-affected mosquitoes. Mr. Pettit, Mr. Morris said, is carrying on experiments in the inoculation of mosquitoes with fungus diseases.

—Mr. Kotinsky reported the receipt from Prof. Carl F. Baker, Claremont, California, of an undetermined insect gall which was

found to be infested by the ant *Azteca bicolor* Emery, by two kinds of scale insects—a *Dactylopius* (*Pseudococcus*) and a *Lecanium*—and by another creature which he was unable to classify. Mr. Banks, who afterwards examined the latter, reports that it is a larva belonging to the dipterous family Platypezidæ, and looks very similar to the larva of the genus *Callomyia*.

—Mr. Caudell exhibited an original drawing of a Walking-stick that has recently been found in Florida and which is an addition to the fauna of the United States. The species is *Hoplopus evadne*, described by Westwood from the West Indies. The specimen from which the drawing was made was taken on Loggerhead Key. He called attention to the fact that the tubercles on the right side of the head are much larger than on the left. He also stated that while the females have aborted wings the wings of the male are well developed.

—Dr. Howard said that it was interesting to note that Mr. C. Schæffer, during his collecting trip to Brownsville, Texas, last June and July, was unable to find a single specimen of the Cotton-boll Weevil (*Anthonomus grandis* Boheman). In view of this, he asked Dr. Morrill, who had visited Brownsville in the middle of last November, for a statement as to the prevalence of the weevil in that locality. Dr. Morrill then stated that in one field examined 75 to 80 per cent. of the cotton squares showed work of *Anthonomus*, and, in another, one or two bolls in every stalk showed that weevils had developed from them. Dr. Morrill stated that the rainfall at Brownsville for the past two years (1901 and 1902) has been less than two-thirds of the normal rainfall for that length of time, and this would explain why weevils have been less abundant than usual.

—Mr. Heidemann exhibited a small collection of Hemiptera, recently received from Costa Rica, and called attention to a number of the interesting species represented.

—Mr. Warner said that he had just been pinning a collection of Peruvian insects and noted that they were very fragile. He did not believe the specimens were insufficiently relaxed but thought that their brittleness might be due to the high altitude or the dry climate in which they were collected. Mr. Barber then remarked that, in his opinion, the brittleness was due rather to

the manner in which they were collected or the material used in killing them. Dr. E. C. Van Dyke had mentioned to him the inadvisability of collecting tiger beetles (*Cicindelidæ*) in cyanide bottles, as it makes them so brittle that they are easily broken when handled, and said that it is much better to kill them in alcohol.

—Mr. Currie exhibited a specimen of *Bittacus chilensis* Blanchard, a Neuropteroid insect belonging to the family Panorpidæ. This, with one other specimen of the same species, is contained in the collection of insects from Chili donated to the U. S. National Museum by Mr. E. C. Reed. Mr. Currie stated that this is the largest species of the genus *Bittacus* of which he has knowledge, and is of especial interest from the fact that, as recorded by McLachlan,* Mr. Reed reported having found it in caves, stating that in other situations it was rare. Dr. Howard remarked that the specimen exhibited by Mr. Currie is very probably the same species as that communicated to Mr. McLachlan by Mr. Reed. Mr. Reed spent many years in Chili, going first to Valparaiso, then to Santiago; and finally, owing to an attack of the coast fever, he had sought a still higher altitude and gone to Baños de Cauquenes, where the larger part of his insect collection was made. Dr. Ashmead said that the Reed collection of Chilean insects was a valuable one, and he was glad that the Museum had come into the possession of it.

—Mr. Morris mentioned some plans for insect exhibit cases that have recently been published in the *Journal of Microscopy*. In the ensuing discussion of the subject of insect exhibit cases and insect exhibits Dr. Howard said that, in his opinion, an exhibit of insects should not be exposed constantly to light, on account of the rapid deterioration of specimens that always results. The most ideal museum, he thought, was that of Dr. A. B. Meyer, of Dresden. This is only open for two hours a day, from 11 o'clock to 1 o'clock, and at other times curtains are drawn so as to exclude the light. Insects should never remain exposed to the direct rays of the sun. Dr. Gill said he thought that rare species should not be put on exhibition, but that an exhibit should be made up of common species and that

*Ent. Monthly Mag., xxx, p. 39, 1894.

these should be so arranged that they can constantly be seen even if they do deteriorate from exposure to light.

—Mr. Barber stated that Mr. Warner has been making some insect groups for the National Museum exhibit at the St. Louis Exposition. One of these groups shows a nest of the common yellow jacket (*Vespa germanica*). The nest for this group was dug out by Mr. Warner and himself at Plummer's Island, Maryland, about the middle of last October. Mr. Warner brought it to the Museum and while working on it noticed a large number of peculiar small white scales attached to the outside of the nest, and called the attention of several persons to them. The opinions vouchsafed as to what they might be were so much at variance as to be amusing—the cocoon of some Microlepidopteron, a scale from some plant or grass seed, the anther of some flower, the egg of some coleopterous, dipterous or hymenopterous parasite, etc., etc. Finally, Mr. Banks called his attention to some published notes* bearing on this subject. In February, 1861, Mr. Walker exhibited before the Entomological Society of London "some very small white pupa cases that were found attached to wasps' nests. These pupæ are finely striated and their size is so very minute that they might have been mistaken for eggs if Mr. Smith had not discovered the skin of a larva inside." Mr. Walker showed also some larvæ taken feeding on the refuse of hornets' nests which Mr. Westwood considered to belong to the dipterous family Anthomyiidae. Mr. Westwood stated at a subsequent meeting that the "cocoons" before mentioned were eggs of a Syrphus fly (genus *Volucella*), well known to live in wasps' nests. Still later he exhibited eggs, pupæ and adults of *Volucella pelluciens* Linnæus from nests of the common wasp. Mr. Barber stated that in Europe several species of *Volucella* are known to lay their eggs on wasps' nests and to live, in the larval state, as scavengers in the nests, feeding on dead larvæ and pupæ and refuse from the wasps. He does not know whether the eggs found by Mr. Warner are those of *Volucella* or not, but believes that they are. He thinks there are no published notes on the occurrence of *Volucella* in wasps' nests in America. Mr. Hubbard, however, found another species

* Proc. Ent. Soc. London, 1861, p. 23; 1862, p. 77; 1865, p. 65.

of the genus (*Volucella fasciata* Macquart) living as a scavenger in the prickly pear cactus (*Opuntia*). To accompany his notes Mr. Barber exhibited specimens of the adults of the three North American species of *Volucella* which may be expected in the vicinity of Washington (*V. evecta* Walker, *V. vesiculosa* Fabricius, and *V. fasciata* Macquart) and a specimen of the European *Volucella bombylans* Linnæus—one of those known to live in wasps' nests. Mr. Barber showed also a number of the supposed eggs of *Volucella* taken from the Plummer's Island yellow jackets' nest and, for comparison, some specimens labeled "eggs of a Syrphid preying upon *Pemphigus acerifolii* Riley. No. 106a, Sept. 20, '81." He exhibited, further, some alcoholic specimens of dipterous larvæ which had later emerged from the yellow jackets' nest. These are quite different in appearance from some first stage larvæ taken from the eggs before mentioned and might, Mr. Barber thought, be similar to those exhibited by Walker, and which Westwood pronounced to be Anthomyiid larvæ.

—Mr. Benton then read the following paper :

THE SPECIFIC NAME OF THE COMMON HONEY-BEE.

BY FRANK BENTON.

For nearly 150 years the most commonly used specific name for our ordinary honey-bee has been *mellifica*, "honey maker," and many hundreds, or I might say, many thousands of books and articles have been written in which this term has been used. Practical bee-keepers in rather recent times have discussed very seriously the question as to whether the honey-bee was a mere gatherer and carrier of honey, or did actually make honey; in other words, whether the finished product as it is placed before the consumer has been sufficiently changed in the manipulation given it by the bees to be accurately described as having been made into honey by the bees themselves.

The use of the specific name *mellifera* (honey bearer) accentuated this discussion somewhat, the question seeming to be, in the minds of many bee-keepers unfamiliar with the laws of zoological nomenclature, merely as to which of the two names would be the more appropriate. Incidentally it may be remarked that, as a matter of fact, neither name describes fully the office of the honey-bee, for the bees certainly do collect and bear the

sweets to their hives; the finished product is very different indeed from the raw nectar as it is collected, and this change is due to the manipulation given to the material by the bees themselves. It consists primarily in the reduction of the water content from 60 or 75 per cent. to 18 or 20 per cent. of the whole mass; and, second, in the addition of formic acid as an antiseptic, and possibly also secretions from other glands located in the head of the bee. The difference between nectar as gathered from the blossoms or floral glands of plants, and thoroughly ripened honey is so great that we may safely say the bees make honey from the nectar.

They are, therefore, bearers and makers. But the discussion in the apiarian journals as to the relative appropriateness of these two names was evidently based on a misconception as to how specific names are given. Finally, to set this matter straight, as the question seemed to be constantly reappearing, I wrote recently for one of the technical apiarian journals,* a popular explanation of the manner in which scientific names are given, and quoted the rules of zoological nomenclature applicable to this case.

The name *mellifica* was published by Linnæus himself in 1761, in "*Fauna Sueciæ*," notwithstanding the fact that he had previously described the honey-bee under the name *mellifera*, in 1758, in the tenth edition of his "*Systema Naturæ*."

These facts were first shown, I believe, by Prof. K. W. von Dalla Torre, in Vol. X of his "*Catalogus Hymenopterorum*," published in 1896; and since, according to Rule XII of the Canons of Zoological Nomenclature, "The law of priority begins to be operative at the beginning of zoological nomenclature," and Rule XIII, "Zoological Nomenclature begins at 1758, the date of the tenth edition of *Systema Naturæ*," the earlier name *mellifera* must take the precedence, without, of course, any reference to its greater or less fitness. Why Linnæus chose to change the name is not apparent. It is possible that, considering the vast field covered by him and the great number of scientific names which he gave to plants and animals in his systematic work, he may have overlooked, in 1761, the fact that three years before that time he had named and described the honey-bee. Of course he readily recognized that he had the same species before him, so it appears more than probable that he himself thought the term *mellifica* (honey maker) would be more appropriate than *mellifera* (honey bearer). At that time no law of zoologists interfered with such a change. It was merely a question as to whether scientific writers would adopt it

* Gleanings in Bee Culture, xxxii, No. 5, March 1, 1904.

or not. It seems, however, that the adoption was general, and has for the greater part held since that date. Of course all systematists will readily see that, as the name *mellifera* goes back to 1758, no older name can possibly replace it, and that Linnæus' name must remain as the authority for this specific name, although as a matter of fact a dozen or more writers (Aldrovandi, Moufet, Swammerdam, Réaumur, etc.), had used the name *mellifera* before 1758.

In the first and second editions of the work by myself, published by the U. S. Department of Agriculture*, I used the specific name *mellifica*. The third edition of the publication cited appeared in 1899. Meanwhile Dalla Torre's "Catalogus" had been published, so that, upon looking up the references given by him, I adopted the name *mellifera*. This was, so far as I am aware, the first publication of the specific name *mellifera* in a practical manual of apiculture. Prof. A. J. Cook, when about to revise his "Guide to Bee Keeping," made an inquiry of the U. S. Department of Agriculture as to the reasons for the change in the specific name of the common honey-bee in the publications of the Department. This matter was referred to me and the reasons were given him in full. Thereupon he adopted, in the edition of his work which appeared in 1900, the specific name *mellifera*. This, so far as I am aware, is the only other work on apiculture which has adopted the name *mellifera*. This information he made later the basis of an extended article on the subject which was published in the "American Bee Journal."†

The Century Dictionary, Webster's International and the New International, have not yet adopted the name *mellifera*, while the Standard Dictionary gives both *mellifera* and *mellifica*, with a statement that the latter is still in most general use. Systematic workers, however, specialists in this group of the Hymenoptera both here and abroad, are quite generally adopting the name *mellifera* in place of *mellifica* in their publications.

Dr. Gill said he regretted that the rules of zoological nomenclature preclude the retention of *mellifica* as the name of the honey-bee, for he agreed with Mr. Benton that it is a better name than *mellifera*, and he thought Linnæus showed sound judgment in substituting it for the latter.

*Bull. No. 1, N. S., Div. of Ent., U. S. Dept. Agric., "The Honey-bee: A Manual of Instruction in Apiculture," 1st ed., 1895; 2d ed., 1896.

†Vol. 51, No. 24, June 13, 1901, p. 372.

—Dr. Ashmead then presented his “Remarks on Philippine Hymenoptera.” He named some of the collectors who have sent Philippine insects to the National Museum, mentioning in particular Father W. A. Stanton, who has lately sent in especially valuable material in the Hymenoptera. Dr. Ashmead mentioned some of the works which contain descriptions of Philippine Hymenoptera. These are very scattered, and the occurrence in the Philippines of species found in India and southeastern Asia, as well as from islands of the Malay Archipelago, makes the work of naming Philippine insects very laborious and difficult. To obviate this he has in preparation a list of Philippine Hymenoptera.* Dr. Ashmead then exhibited two boxes of Hymenoptera from the Philippines, and called attention to a number of species of peculiar interest. He has found very few new species in the Aculeata, but among the Parasitica there are a large number. For instance, in the Proctotrypidæ there were formerly no species known from the Philippines, but he has found one species among some material recently received by the National Museum. In addition to the Stanton collections, a number of valuable specimens have been received from Miss Clara S. Ludlow.

Dr. Howard asked Dr. Ashmead if any of the Chalcid-flies received from the Philippines belong to cosmopolitan species. Dr. Ashmead replied that none of them do, but this is probably because none of the species sent him have been reared from Coccidæ. The parasites of Coccidæ, as is well known, are largely cosmopolitan. Mr. Caudell asked Dr. Ashmead if any Hymenoptera are listed in Casto de Elera’s catalogue of Philippine insects. Dr. Ashmead replied that there are, but that some of the records are inaccurate. Dr. Gill stated that this catalogue is very poor, since in many cases it is not a record of species actually found in the Philippines, but a list of species which, in the author’s opinion, should or might be found there, and also those of the museum under the author’s care.

Dr. Howard asked Dr. Gill whether the fauna shows that there is more than one life-zone in the Philippines. Dr. Gill

* Subsequently published in Journ. N. Y. Ent. Soc., XII, No. 1, pp. 1–22, March, 1904.

replied that it depends a good deal upon what class of animals one has reference to. The mammals are decidedly of the Oriental type, and many species are shared with Indo-China and the East India islands, but in the highlands have been found a number of genera (six or more) of muriform rodents peculiar, so far as known, to Luzon. There are really no typical representatives of Australian mammals. The numerous birds exhibit, on the whole, nearly the same kind of relationship as the mammals; their distribution has been well studied by the American naturalists Steere, Bourns and Worcester. The last relegates the Western Philippines (Palawan and Balabac) to the Bornean group of islands. The northern and southern islands have few species of Passerines in common, many genera being represented by analogous species. There is a very slight infusion of the Australian fauna. The reptiles and amphibians tell the same story. The species are quite numerous—nearly a hundred reptiles and somewhere near thirty amphibians—and they are elsewhere found, mostly in the neighboring archipelago, but quite a number as far west as India. The peculiar species are relatives of inhabitants of the same regions. The fresh water fishes are of the same character, that is, the same as or relatives of inhabitants of Borneo and other islands of the same group and India. The terrestrial gastropods tell a different tale. The hundreds of species are mostly peculiar to the Philippine archipelago and a very large proportion belong to genera peculiar to the islands—genera mostly distinguished by a showy hydrophanous shell and whose species are mainly arboreal. Otherwise the relations of the species and genera are chiefly with Indo-Moluccan and Southeastern Asia and India. There is very slight manifestation of the influence of the Australian fauna. In fine, the universal testimony is to the effect that the fauna of the Philippine islands is decidedly related to that of neighboring Asia and the islands as well as India. In fact, it belongs to the Oriental realm and is very slightly—scarcely at all—modified by Australian elements.

MARCH 10, 1904.

The 185th regular meeting was held at the Sængerbund Hall, 314 C Street N.W. Dr. Hopkins presided, and the following members were present: Messrs. Ashmead, Barber, Benton, Burke, Busck, Caudell, Currie, Doolittle, Dyar, Fiske, Gill, Heidemann, Howard, Kotinsky, Morris, Patten, Piper, Schwarz, Warner and Webb.

—Dr. Dyar presented the following notes:

NOTE ON THE LARVA OF THERINA SOMNIARIA HULST.

By HARRISON G. DYAR.

This species has been referred as a variety of *T. fervidaria* Hübner, but is really distinct. The characters pointed out by Hulst are constant. A series of 46 specimens is before me from Mt. Hope, Oregon (F. Epper), and Gray's Harbor, and Satsop, Washington (H. E. Burke). Mr. Burke has found the larvæ common on oak (*Quercus garryana*), which adds another distinguishing character between the forms, since the larvæ of *T. fervidaria* are addicted to spruce. I have specimens bred at the Department of Agriculture on spruce (*Abies balsamea*) from King, Maine, under the number 8698. Mr. Burke brought home a number of the larvæ of *T. somniaria* in alcohol. They may be described as follows:

Larva. Shaped and colored as in the other species of *Therina* and very variable. Head wide bilobed, flattish before, clypeus depressed, lobes full, wider than high; white with sparse gray spots over the lobes, a black spot on tubercles i and ii; sutures, jaws and ocelli dark. Body moderate, rather flattened; light gray, nearly white, smooth. Subdorsal line broad, white, narrowly dark edged; venter broadly white. Between these marked variably in black. The lightest form has a faint, double, crinkled addorsal line, black spots on tubercles i and ii, two black lines representing the edges of an obsolete lateral line with a black bar below tubercle ii between the subdorsal and lateral lines; spiracles black; two fine black lines in the subventral area. The dark forms are checkered with black in large quadrate patches, forming a smaller checkered pattern on the dorsum and large blotches on the sides.

The pupa is nearly white, thickly spotted with black on the abdomen and streaked on the cases. The last segment is entirely black; the cremaster has a few stout hooks.

Professor Piper stated that Dr. Fletcher reported the larvæ of *Therina somniaria* as completely defoliating the oak trees in portions of Vancouver Island several years ago.*

NOTE ON THE LARVA OF MELANCHROIA GEOMETROIDES WALKER.

By HARRISON G. DYAR.

Mr. Schwarz brought home from Cuba some larvæ of this species in alcohol, and three moths that he had bred. He found them toward the end of December on a cultivated plant, Otaheite gooseberry (*Cicca disticha*), at Cayamas, Cuba. They had defoliated the plant and ate large patches of the bark besides. Mr. Schwarz fed the larvæ that he bred on the bark as there were no more leaves left. The three moths lack entirely the usual white dashes on the upper sides of the wings, though one shows a trace of them below. Gundlach, in Ent. Cubana, records an experience similar to that of Mr. Schwarz of the larvæ eating the bark.

Larva. Head rounded, full, narrowed a little above, slightly bilobed, broad; bright red, labrum pale yellow, jaws and ocelli black. Body uniform, not elongate, equal, central segments about as long as wide, abdominal feet on joints 10 and 13, the anal pair with triangular plates; all feet bright red. Body black, marked with pale yellow; four to six transverse dorsal bars on each segment, the central ones longest, the marginal ones shorter and rounded, separated by a subdorsal area of ground color from a similar lateral series, the base of which are more confused and partly confluent. An even, broad, ventral stripe of pale yellow, somewhat transversely barred on the annulets like the dorsal markings. Tubercles obscure, concolorous, setæ moderate, black.

NOTE ON THE GENUS LEUCOPHOBETRON DYAR.

By HARRISON G. DYAR.

I proposed this generic term in 1897 for the Cochlidian species *argentiflua* Geyer and *argyrorrhea* Hübner, but gave no exact characters. I have now before me two male specimens of *argentiflua* from Cayamas (E. A. Schwarz), and Santiago, Cuba (Capt. Wirt Robinson), and give from them the generic characters. In Ent. Cubana, p. 274, Gundlach refers to this species

* Report of Entomologist and Botanist, from Ann. Rept. Experimental Farms (Canada), for year 1890, pp. 154-188.

under the genus *Euproctis*, though he evidently recognized it was not a Liparid but a Cochlidian. He briefly mentions the larva as whitish green, furnished with fleshy prolongations. Obviously it resembles the larvæ of *Alarodia* and *Isochætès* as would be expected.

♂ antennæ bipectinated to the tip, the pectinations decreasing outwardly; head subprominent, palpi curved, slender, just to the frontal tuft; front trigonate, narrowed below, smooth with the erect hairs of tuft centrally. Legs long, hairy; four spurs. Fore wings with costa straight, veins 2 and 3 separate, cell with short-forked open discal vein, 7 from apex of cell, 8 to 10 stalked; hind wings with 6 and 7 at apex of cell, 8 anastomosing at base. Form large and robust, otherwise as in *Alarodia*.

—Mr. Caudell exhibited a living male specimen of the rare cockroach *Temnopteryx deropeltiformis* Brunner. He reared this roach from a larva taken last fall at Falls Church, Virginia. There are known to him but two other instances of the capture of this species east of Indiana—a ♀ taken by Mr. Jacob Kotinsky at Washington, D. C., two years ago, and another ♀ taken by Mr. Nathan Banks at Falls Church, Virginia, one year later. Wasmann* records this as a myrmecophilous insect, his record being based on specimens sent him by Mr. T. Pergande and collected under stones at Cabin John Bridge, Maryland. Not long ago Mr. Caudell visited this locality with Mr. Pergande and under stones in exactly similar situations found specimens which Mr. Pergande pronounced the same as those sent to Wasmann. These were nymphs and, on maturing, proved to be *Ischnoptera uhleriana* Saussure. Mr. Caudell stated that he had no doubt that the specimens sent Wasmann are this species and not *Temnopteryx*. The specimens of *T. deropeltiformis* were taken in decaying wood, and Mr. Caudell said he did not believe that *Temnopteryx* had been found in ants' nests. He added that there are, in the National Museum, specimens of this species from Texas.

—Mr. Caudell mentioned, also, another cockroach new to the vicinity of Washington—*Ischnoptera intricata*, recently de-

*Kritisches Verzeichniss der Myrmekophilen und Termitophilen Arthropoden, p. 176. Berlin, 1894.

scribed by Blatchley. It was collected by Mr. Nathan Banks at Falls Church, Virginia.

—Mr. Currie exhibited a handsome and peculiarly marked lace-wing fly, belonging to the genus *Hemerobius* and apparently representing a new species. It was collected by Mr. H. S. Barber at Little River, Humboldt county, California, on the 31st of last May. He then presented for publication the two following papers, in the first of which this insect is described :

NOTES ON SOME HEMEROBIIDÆ FROM ARIZONA AND CALIFORNIA.

By ROLLA P. CURRIE.

During the spring and summer of 1903, Mr. H. S. Barber visited the western part of Humboldt county, California, in the interest of the U. S. Department of Agriculture, to investigate forest insects and make collections. *En route* he spent a couple of days at the Grand Canyon of the Colorado river at Bright Angel, where he collected a number of insects. Although not looking especially for Hemerobiids he nevertheless secured a few species—five in all from Arizona and California—and two of the California ones appear to be new to science. None of the three species obtained at Bright Angel are new to Arizona but are included in Mr. Nathan Banks' recent paper on "Neuropteroid Insects from Arizona," * although not there listed from this particular locality.

Hemerobius mæstus Banks.

Bright Angel, Colorado Canyon, Arizona, altitude 3,700 feet, 10 May, two specimens; Samoa, Humboldt county, California, 23 May, one specimen.

The California specimen is teneral, both body and wings being very pale. This species was collected at Williams, Arizona, by Messrs. Schwarz and Barber on July 29, 1901.

Hemerobius bistrigatus, n. sp.

Alar expanse 15.5 mm. Head, including the antennæ, pale yellowish, the latter darker toward tip; a stripe below each eye, lateral margins of clypeus, a line surrounding the vertex, rear of eyes, and apical joint of palpi, piceous. Pronotum dark each side, pale yellowish in the middle and on posterior lateral angles; meso- and metathorax pale on dorsum, obscurely darker on sides and below, metanotum darker than the mesonotum. Abdomen dark. Legs pale yellowish, tips of tarsi dark.

* Proc. Ent. Soc., Wash, v, No. 4, pp. 237-245, author's extras published April 29, 1903.

Anterior wings rather narrow—their width slightly more than one-third their length—their tips obtusely pointed, hind margin flattened before tip; costa flattened apically, making this portion of the costal area narrow, the basal half rather narrow; hyaline, with a smoky tinge, the veins pale and marked with minute, indistinct reddish dots; each wing with two broad, longitudinal fuscous streaks, as follows: (1) An anterior streak, arising near base of first radial sector and extending along this vein to the hind margin of the wing, widening at inner gradate series so as to include the second sector and at apex of wing covering the area embraced between the tips of first and third sectors; (2) a posterior streak, arising obscurely near base of wing and extending along the hind margin out to, or almost to, the tip of anterior fork of median vein, darkest along its anterior border which consists of the apical portions of cubitus and of posterior fork of median; posterior fork of median strongly bent toward cubitus, thus making the inner veinlet connecting it with the cubitus much shorter than the outer; radio-median cross vein situated at least as far before the forking of the median as the former is long and joining radius much before origin of first sector; forking of median plainly before origin of first sector; three radial sectors, anterior branch of the third forked before the inner gradate series and before the subpterostigmal radial cross vein, posterior branch simple; five gradate veins in inner series, the last very slightly before the next to the last, seven in outer series. Posterior wings hyaline with a smoky tinge, the veins as in anterior pair, a very faint trace of the two streaks of anterior wings; the first fork of radial sector plainly before forking of median; Pterostigmata of both wings reddish.

Little River, Humboldt county, California, 31 May, one specimen.

Type.—No. 7901, U. S. National Museum.

Allied to *H. mæstus* and belonging to the same group and section, but readily distinguished from it and from other known species of the genus by the peculiar wing streaks.

Hemerobius pacificus Banks.

Bright Angel, Colorado Canyon, Arizona, altitude 2,300 feet, 10 May, one specimen.

Collected also at Williams, Arizona, May 27, 1901, by Messrs. Schwarz and Barber.

Hemerobius pallescens, n. sp.

Alar expanse 19.5 mm. Body above and below, including palpi, legs and antennæ, pale yellowish. Head with a stripe below each eye and a line on lateral margins of vertex piceous, basal antennal joint rufopiceous externally. Pronotum with a dark stripe each side, leaving a longitudinal median line and the posterior lateral angles pale. Anterior wings rather broad—their width two-fifths of their length—their tips rather acutely

pointed, hind margin flattened and slightly concave before tip, basal half of costal area rather narrow; hyaline, with pale brown markings, those in apical portion of wing more or less coalescent and forming on each gradate series an oblique streak; pterostigma indistinct, pale; an indistinct pale line bisects the costal space longitudinally through the bases of intercostal forks; veins pale, with numerous brown interruptions, those on radius and cubitus most pronounced; each brown spot on the longitudinal veins between radius and hind margin gives off an oblique pale brown mark each side, thus forming several series of V-shaped markings, the angle of the V's pointing inward; gradate veins almost wholly brown; hind margin of wing brown, interrupted with pale spots; posterior fork of median vein strongly bent toward the cubitus, thus making the inner veinlet connecting it with the cubitus much shorter than the outer; radio-median cross vein situated at least as far before the forking of the median as the former is long and joining radius much before origin of first sector; three radial sectors, anterior branch of the third forked before the inner gradate series and before the subpterostigmal radial cross vein, posterior branch simple; five gradate veins in inner series, the last beyond the next to the last, seven or eight in outer series (seven in left wing, eight in right wing, in the type specimen). Posterior wings hyaline, unmarked; the veins pale, tinged with reddish brown, some of the gradate veins darker; the first fork of radial sector plainly before forking of median.

Fieldbrook, Humboldt county, California, 30 May, one specimen.

Type.—No. 7902, U. S. National Museum.

This species, also, is allied to *H. pacificus*, and falls in the same group and section of the genus. It differs from *pacificus* in its larger size, paler color, broader, more pointed, differently shaped and differently marked wings, etc.

Micromus variolosus Hagen.

Bright Angel, Colorado Canyon, Arizona, altitude 2,300 feet, 10 May, five specimens.

This is a widely distributed species in Arizona and has been recorded from Williams, Hot Springs (in Yavapai county), Prescott, Flagstaff, Winslow and the Santa Rita and Chiricahua Mountains. It is common, also, in other parts of the west.

HEMEROBIIDÆ FROM THE KOOTENAY DISTRICT OF BRITISH COLUMBIA.

By ROLLA P. CURRIE.

The Hemerobiid lace-winged flies collected in British Columbia last summer by Dr. H. G. Dyar, Mr. A. N. Caudell and myself comprised twelve species, represented by eighty-six

specimens. Of the various species obtained, *Polystæchotes punctatus*, *Hemerobius pacificus*, *H. disjunctus* and *Micromus montanus* appear to be the commonest species, with *Hemerobius mæstus*, perhaps, coming next in abundance. The finding of *Hemerobius castaneæ* and *Sisyra vicaria* is of interest. It is rather unfortunate that each of the five new species described in this paper is represented by a single specimen only; yet the characters they exhibit appear to differentiate them well from the species previously recognized.

I am indebted to Mr. Nathan Banks for the loan of his collection to aid in determining our material, and for helpful suggestions.

The four genera represented in the collection may be distinguished by the key given in Needham's "Aquatic Insects in the Adirondacks." *

Sisyra vicaria (Walker).

Hemerobius vicarius Walker, Brit. Mus. Cat., Neur., p. 297, 1853.

S[isyra] vicaria Hagen, Syn. Neur. N. Am., p. 197, 1861.

"Lilypad Lake," Kaslo, 8 July. Two specimens of this interesting little Hemerobiid, whose larvæ are known to live parasitically on fresh water sponges, were secured on the borders of a small marshy pond in the forest. This is the first record of the capture of *Sisyra* in Western North America. It seems possible that the related genus *Climacia*, the larvæ of which, as discovered by Needham, have similar habits, may also some day be found in the West.

These specimens appear to differ somewhat from examples in the National Museum labeled *vicaria*, yet do not in all respects agree with Needham's description of *umbrata*,† the only other described North American species. It does not yet appear certain that Needham's and Walker's species are distinct, and a good series of *vicaria* from Georgia, the type locality, may be necessary to definitely settle the question. These things considered, I prefer not to describe the two specimens from British Columbia, perhaps more or less teneral, as representing a new species.

Polystæchotes punctatus (Fabricius).

[*Semblis*] *punctata* Fabricius, Ent. Syst., II, p. 73, 1793.

P[olystoechotes] punctatus Hagen, Syn. Neur. N. Am., p. 206, 1861.

Kaslo, 12 July to 20 August, 28 specimens; Robson, 20 August (Dyar: three specimens); Arrow Lake, 21 August (Dyar:

* Bull. N. Y. State Mus., No. 47, p. 551, September, 1901. What Needham, under *aa* in his key, terms *branches* of the radial sector are commonly known simply as radial sectors.

† Bull. N. Y. State Museum, No. 47, p. 555, pl. 12, figs. 6 and 7, text figs. 33, 34 and 36, September, 1901.

two specimens) ; Sandon (G. C. Robbins: nine specimens). Dr. Dyar secured, also, two specimens at Victoria on August 24, and three more at Shawnigan Lake (Vancouver Island) on September 1.

A very abundant species during the latter part of the summer and commonly attracted to the electric lights. All our specimens were taken in houses, either flying around the lights, in the evening, or, in the daytime, resting on the walls, having flown in the night before. They exhibit great variation in size, the length to tip of folded wings ranging from 21 mm. to 34 mm.

Genus *HEMEROBIUS* Linnæus.

The species of the genus *Hemerobius* in the collection all belong to the group having three radial sectors. The following key may be of assistance in distinguishing them :

KEY TO THE SPECIES OF *HEMEROBIUS* OF THE KOOTENAY DISTRICT, B. C.

- a* Posterior fork of median vein bent toward cubitus, thus making the inner veinlet connecting it with cubitus shorter than the outer; radio-median cross vein situated at or before forking of median, and joining radius at or before origin of first sector; in hind wings first fork of radial sector plainly before forking of median.
- b* Radio-median cross vein situated at least as far before forking of median as the former is long, and joining radius much before origin of first sector; forking of median plainly before origin of first sector.
- c* Pterostigma reddish *mæstus*
- cc* Pterostigma not reddish.
- d* A longitudinal, median, dorsal, pale yellowish stripe on thorax, or the latter mostly pale yellowish; anterior branch of third radial sector forked before inner gradate series, and, normally, before *subpterostigmal radial cross vein*.*
- e* Wings plainly marked with fuscous on gradate series, apex and hind margin..... *castaneæ*
- ee* Wings but faintly marked with fuscous on gradate series, apex and hind margin.
- f* Wings rather broad, obtusely pointed at tip; pterostigma small and indistinct; spots along radius and cubitus small; larger species..... *pacificus*

*I apply this term to the inner of the two veins connecting the radius and its outermost sector and lying more or less in line with the inner gradate series. The anterior branch of third sector is forked at the subpterostigmal radial cross vein in left fore wing of *H. dyari*, type, but this is undoubtedly abnormal.

- ff* Wings narrow, rather narrowly rounded at tip; pterostigma large and distinct; spots along radius and cubitus large; smaller species.....*dyari*
- dd* No dorsal pale stripe on thorax, which is wholly dark except for a small spot in center of mesonotum; anterior branch of third radial sector forked as far out as, or beyond, inner gradate series and beyond subpterostigmal radial cross vein.*kokaneanus*
- bb* Radio-median cross vein situated at, or but slightly before, forking of median, and joining radius at, or but slightly before, origin of first sector; forking of median not before, but almost directly beneath, origin of first sector.
- c* Alar expanse more than 12 mm.; body dark; wings plainly marked with fuscous.
- d* Anterior branch of third radial sector forked as far out as, or beyond, inner gradate series and subpterostigmal radial cross vein; last gradate vein of inner series beyond the next to the last.....*caudelli*
- dd* Anterior branch of third radial sector forked before inner gradate series and subpterostigmal radial cross vein; last gradate vein of inner series before the next to the last.*glacialis*
- cc* Alar expanse less than 12 mm.; body pale; wings very faintly marked with pale brownish.....*kootenayensis*
- aa* Posterior fork of median not bent toward cubitus, the inner veinlet connecting it with cubitus not shorter than the outer; radio-median cross vein situated beyond forking of median and connecting anterior fork of the latter with first radial sector; in hind wings first fork of radial sector beneath, or beyond, forking of median.....*disjunctus*

Hemerobius mæstus Banks.

Hemerobius mæstus Banks, Trans. Am. Ent. Soc., xxiv, p. 25, February, 1897.

Kaslo, 16 June to 8 July, three specimens.

The specimen collected on June 16 seems to be in the teneral condition, the wing markings being indistinct. The wings in this specimen are somewhat broader than in the two others.

Hemerobius castaneæ Fitch.

H[emerobius] castaneæ Fitch, First Rep. Insects N. Y., p. 94. 1856.

H[emerobius] castaneæ Hagen, Syn. Neur. N. Am., p. 202, 1861.

Kaslo, 2 and 24 July, two specimens.

In view of the fact that *H. pacificus* has been considered as possibly a western form of this species, it is somewhat of a surprise to find in our collection examples of what appear to be typical *castaneæ*. The ten specimens of *pacificus* collected in British Columbia show no gradation toward *castaneæ* and indications are that these two forms are distinct species.

Hemerobius pacificus Banks.

Hemerobius pacificus Banks, Trans. Am. Ent. Soc., xxiv, p. 24, February, 1897.

Kaslo, 29 May to 5 August, ten specimens.

Hemerobius dyari, n. sp.

Alar expanse 13 mm. Body above and below, including legs and antennæ, pale yellowish, the latter darker toward tip. Face indistinctly bordered with darker and with an indistinct line around antennal sockets, piceous below each eye and on lateral margins and middle of clypeus; apical joint of palpi piceous. Pronotum dark each side, leaving a longitudinal median pale stripe. Anterior wings rather narrow—their width scarcely more than one-third their length—their tips rather narrowly rounded; basal half of costal area rather narrow; costa flattened—almost concave—in the middle, strongly convex above the large pale pterostigma; smoky hyaline, with pale spots along the longitudinal veins; veins pale, with indistinct brownish spots—most pronounced along the radial sectors from inner to outer gradate series; hind margin of wing, from middle to apex, brownish, interrupted with pale spots and with a brownish spot near base; radius spotted with dark brown from near base to pterostigma; cubitus, also, spotted with dark brown, some of the spots larger than those on the radius, the largest one covering the basal veinlet connecting with the posterior fork of the median, and another large one midway between this and the apical connecting veinlet; a large, paler brown spot on the median above the apical connecting veinlet; posterior fork of median bent toward cubitus, thus making the inner veinlet connecting it with cubitus shorter than the outer; radio-median cross vein situated at least as far before forking of median as the former is long and joining radius much before origin of first sector; forking of median plainly before origin of first sector; three radial sectors, anterior branch of the third forked before inner gradate series (and before subpterostigmal radial cross vein in right wing of type specimen, *at* this vein in left wing), posterior branch simple; five gradate veins in inner series, the last (hindmost) slightly beyond the next to the last, seven in outer series.* Posterior wings hyaline, unmarked, the veins wholly pale; first fork of radial sector plainly before forking of median.

Kaslo, 17 July, one specimen.

Type.—No. 7896, U. S. National Museum.

This species fails in Banks' Group II, Section A,† and is allied

*In the outer gradate series I include the outer of the two transverse veins connecting the radius and the third sector; the inner of these two transverse veins, however, is *not* included in the inner gradate series and is alluded to as the *subpterostigmal radial cross vein*.

† Trans. Am. Ent. Soc., xxiv, p. 24, February, 1897.

to *H. pacificus*. It differs from the latter in being of smaller size, and in having narrower and differently shaped wings, larger and more distinct pterostigma and larger spots along radius and cubitus.

Hemerobius kokaneeanus, n. sp.

Alar expanse 14 mm. Body above and below obscure fuscous or piceous; the basal half of antennæ, posterior lateral angles of pronotum, a small spot in center of mesonotum, and the legs mostly, pale. Anterior wings rather narrow—their width less than two-fifths of their length—their tips narrowly rounded, hind margin flattened apically, the basal half of costal area very narrow; hyaline, tinged with smoky and marked with fuscous; veins pale, with scattered brown spots—principally where crossed by the wing markings; these wing markings comprise an irregular, more or less interrupted band on each gradate series, a large spot on subpterostigmal radial cross vein, some spots at fork of median and along cubitus, hind margin (with the exception of a few pale interruptions), and series of smaller spots on the longitudinal veins between radius and hind margin; pterostigma indistinct; a pale longitudinal line bisects costal space through the bases of intercostal forks; posterior fork of median strongly bent toward cubitus, making the inner veinlet connecting with cubitus much shorter than the outer; radio-median cross vein situated at least as far before the forking of median as the former is long, and joining radius much before origin of first sector; forking of median plainly before origin of first sector; three radial sectors, anterior branch of the third forked as far out as, or beyond, inner gradate series (as far out as inner series in left wing, and beyond inner series in right wing, in the type specimen) and beyond subpterostigmal radial cross vein, posterior branch simple; five gradate veins in inner series, the last before the next to the last, six or seven in outer series (six in right wing, seven in left, in the type specimen). Posterior wings hyaline, with a faint smoky tinge, most of the veins dark, the longitudinals pale at base; first fork of radial sector plainly before forking of median.

Kokanee Mountain, altitude 9,000 feet, 10 August, collected upon snow on glacier; one specimen.

Type.—No. 7897, U. S. National Museum.

The venation of this species seems to place it with *H. pacificus*, *H. castaneæ* and *H. dyari*, except that in these latter three the anterior branch of the third radial sector is forked before the inner gradate series and subpterostigmal radial cross vein, while in *H. kokaneeanus* it is forked as far out as, or beyond, inner gradate series and beyond the subpterostigmal radial cross vein. The wholly dark thorax and the darker and more closely approximated wing markings, however, readily distinguish it from any of the species just mentioned.

Hemerobius caudelli, n. sp.

Alar expanse 13.2 mm. Body above and below obscure fuscous or piceous; the basal half, or more, of antennæ, the vertex, hind portion of pronotum medially and its posterior lateral angles, meso- and metanotum medially, and the legs, pale. Anterior wings rather broad—their width two-fifths of their length—their tips and hind margin rounded, basal half of costal area rather broad; hyaline, marked with dark and pale fuscous; veins pale, with fuscous interruptions—principally where crossed by the wing markings; these wing markings consist of an irregular, more or less interrupted band on each gradate series, numerous shorter, irregular, transverse spots or bands between them and before them to near base of the wing, numerous short, nearly confluent, transverse spots at apex and hind margin, and series of transverse pale fuscous spots in costal and anal areas; a pale longitudinal line bisects costal space through bases of intercostal forks; pterostigma indistinct, creamy whitish; posterior fork of median somewhat bent toward cubitus, making the inner veinlet connecting with cubitus a little shorter than the outer (no inner connecting veinlet in left wing of type); radio-median cross vein situated a little before forking of median and joining radius at, or a little before, origin of first sector (a little before first sector in right wing, *at* first sector in left wing, in the type specimen); forking of median almost directly beneath origin of first sector; three radial sectors, anterior branch of the third forked as far out as, or beyond, inner gradate series and subpterostigmal radial cross vein (*at* these in left wing, beyond these in right wing, in the type specimen), posterior branch simple; four or five gradate veins in inner series (four in right wing, five in left, in the type), the last beyond the next to the last, five or six in outer series (five in right wing, six in left, in the type). Posterior wings hyaline, faintly tinged with smoky on gradate veins and elsewhere; veins mostly dark, the longitudinals pale at base; first fork of radial sector plainly before forking of median.

London Hill Mine, Bear Lake, altitude 7,000 feet, 29 July, collected upon snow; one specimen.

Type.—No. 7898, U. S. National Museum.

This species bears some resemblance to *H. kokaneeanus*, but differs from it in the position of the radio-median cross vein and in the relative position of the forking of the median vein and origin of first radial sector; it differs, also, in that the vertex and the meso- and metanotum are largely pale, the wings broader and more rounded and their markings larger and more extended, while the last veinlet of inner gradate series is beyond the next to the last. It belongs in Banks' Group II, Section A, as do all the other species of *Hemerobius* in the collection, with the exception of *H. disjunctus*.

Hemerobius glacialis, n. sp.

Alar expanse 15.5 mm. Body above and below obscure fuscous or piceous; basal half of antennæ, vertex, a posterior central spot and posterior lateral angles of pronotum, a broad longitudinal median band on meso- and metanotum, and the legs principally, pale. Anterior wings rather broad—their width two-fifths of their length—their tips? (torn off), basal half of costal area rather broad; hyaline, tinged with smoky and marked with fuscous; veins pale, with scattered brown spots—principally where crossed by the wing markings; these wing markings consist of an irregular, more or less interrupted band on each gradate series, numerous short, irregular spots (sometimes tending to form bands) along the longitudinal veins, some larger spots at forking of median and along cubitus, a large spot on subpterostigmal radial cross vein, and some transverse spots in costal area, these spots pale in basal portion; apex and hind margin of wing tinged with smoky; pterostigma indistinct; a longitudinal pale line bisects costal area at bases of intercostal forks; posterior fork of median bent toward cubitus, making the inner veinlet connecting with cubitus shorter than the outer; radio-median cross vein situated at the base of fork of median and joining radius at origin of first sector; forking of median almost directly beneath origin of first sector; three sectors, anterior branch of the third forked before inner gradate series and subpterostigmal radial cross vein, posterior branch simple; five gradate veins in inner series, the last before the next to the last, six in outer series. Posterior wings hyaline, with a faint smoky tinge, most of the veins dark except at base; first fork of radial sector plainly before forking of median.

Kokanee Mountain, altitude 9,000 feet, 10 August, collected upon snow on glacier; one specimen.

Type.—No. 7899, U. S. National Museum.

This Hemerobiid bears some resemblance to *H. kokanceanus* and *H. caudelli*. It seems to be more closely related to the latter, however, since it substantially agrees with that species in the position of the radio-median cross vein and the relative position of the forking of median vein and origin of first radial sector; like that species, also, it is pale on the vertex and on the meso- and metanotum. It differs from *H. caudelli* in that the last gradate vein of inner series is before the next to the last, while the anterior branch of third radial sector is forked before the inner gradate series and subpterostigmal radial cross vein; the wing markings, also, are smaller and less extended.

Hemerobius kootenayensis, n. sp.

Alar expanse 11 mm. Body above and below, including legs and antennæ, pale yellowish, the latter somewhat darker apically; a stripe below each eye and the apical joints of palpi piceous; sides of face tinged with red-

dish. Anterior wings rather broad—their width slightly more than two-fifths of their length—their tips narrowly rounded, almost pointed, hind margin rounded, basal half of costal space broad; hyaline, faintly tinged with pale brownish, especially on veins on inner gradate series, at base and apex of cubital cell, and along hind margin basally; veins pale yellowish; posterior fork of median bent toward cubitus, making the inner veinlet connecting it with cubitus a little shorter than the outer; radio-median cross vein situated at, or but slightly before, forking of median (*at* forking of median in left wing, slightly before it in right wing, in type specimen), and joining radius at origin of first sector; forking of median almost directly beneath origin of first sector; three sectors (four in right wing in type specimen, but the fourth forked only once before inner gradate series and subpterostigmal radial cross vein), anterior branch of third (in left wing of this specimen) forked before inner gradate series and subpterostigmal radial cross vein, posterior branch simple; five gradate veins on inner series, the last very slightly before the next to the last, the third from the last and next to the last particularly coinciding, seven in outer series. Posterior wings hyaline, unmarked, the veins pale yellowish; first fork of radial sector plainly before forking of median.

Kalso, 17 June, one specimen.

Type.—No. 7,900, U. S. National Museum.

This diminutive *Hemerobius* is allied, by venation, to *H. caudelli* and *H. glacialis*—particularly to the latter. The faint, pale brownish wing markings suggest that the type may be a freshly emerged specimen and not fully colored. Its size and appearance suggest *H. canadensis* Banks, but the latter is described as having the “cubitus [median] *not* curving toward the postcubitus [cubitus], the connecting veinlets each way about equal, a connecting veinlet from cubitus [median] to radius *before* the origin of the first sector; . . . *four or five* gradate veinlets in outer series,” etc. (The bracketed words and italics are mine.)

***Hemerobius disjunctus* Banks.**

Hemerobius disjunctus Banks, Trans. Am. Ent. Soc., xxiv, p. 25, February, 1897.

Kalso, 13 June to 20 August, four specimens; Bear Lake, 29 July, one specimen; Kokanee Mountain, altitude 9,000 feet, 10 August, collected upon snow on glacier, two specimens; Revelstoke, 14 August (Currie) and 22 August (Dyar), two specimens.

The specimen collected on June 13 is in the teneral condition.

***Micromus montanus* Hagen.**

Micromus montanus Hagen, Proc. Bost. Soc. Nat. Hist., xxiii, p. 279, September, 1886.

Kaslo, 11 June to 5 August, four specimens; Ainsworth, 11 July, two specimens; Kokanee Mountain, altitude 8,000 feet, 10 August, one specimen.

The specimen collected on June 11 is teneral.

The two following papers were read by title:

NEW DIPTERA FROM CENTRAL AMERICA.

By D. W. COQUILLET.

In the month of August, 1903, Prof. Carl F. Baker, of Pomona College, Claremont, California, donated to the National Museum a duplicate series and the unique specimens of Diptera collected by himself during a trip through Mexico and Central America, the only conditions being that the writer would engage to identify the specimens and publish descriptions of the new forms. The task of identifying and describing having now been completed, the descriptions are offered herewith:

Family CHIRONOMIDÆ.

***Ceratopogon terminalis*, n. sp.**

Black, the legs yellow, the hind tibiæ and their tarsi except their bases brown (antennæ, front tarsi, and middle tibiæ and their tarsi wanting); eyes rather widely separated, head and body polished, mesonotum somewhat scabrous, its hairs whitish; legs slender, devoid of spines, outer side of hind tibiæ and upper side of their tarsi fringed with rather long hairs, first joint of hind tarsi nearly twice as long as the second; wings very long and narrow, bare, whitish hyaline, the broad apex brown, apex of third vein near nine-tenths of the length of the wing, this vein wholly separated from the first vein and from the costa, not connected by a cross-vein; apex of first vein near one-fourth of the length of the third; veins whitish, the third vein, small cross-vein and last section of the costa brown, fourth vein forks slightly before the small cross-vein. Length 3 mm.

A female specimen from San Marcos, Nicaragua.

Type.—No. 7807, U. S. National Museum.

Family MYCETOPHILIDÆ.

***Sciara trifasciata*, n. sp.**

Yellow, the front, upper part of the occiput, a pair of elongate-oblong spots on the mesonotum, the knobs of the halteres and the second, third and fourth segments of the abdomen except the narrow front margins of

the first two, black; the antennæ and tarsi except their bases brown; head rounded, rostrum broader than long; body somewhat polished; wings hyaline, apex of first vein considerably before the forking of the fourth, lower end of the small cross-vein before the forking of the fifth vein. Length 2.5 mm.

A female specimen from San Marcos, Nicaragua.

Type.—No. 7792, U. S. National Museum.

Family BIBIONIDÆ.

Dilophus fumosus, n. sp.

Black, the front coxæ, and the front and middle femora, except their extreme ends, yellow (hind femora, tibiæ and tarsi wanting); hairs black; rostrum narrow and elongate, longer than the eyes, the antennæ inserted at one-fourth of the distance from the base; front tibiæ bearing a pair of spines on the posterior side at one-third length of tibiæ, an oblique row of four spines at the middle and a row at the apex; wings pale brown, the costal cell and stigma dark brown. Length 6 mm.

A male specimen from Granada, Nicaragua.

Type.—No. 7793, U. S. National Museum.

Dilophus rhynchops, n. sp.

Black, the first antennal joint, front coxæ, their trochanters and femora, also basal half of hind femora, yellow (middle legs wanting); hairs black; rostrum about as long as the eyes, antennæ inserted at one-fifth of its length; body polished; spines of front tibiæ as in *fumosus*; wings hyaline, costal cell smoky, stigma brown. Length 3 mm.

A male specimen from Granada, Nicaragua.

Type.—No. 7794, U. S. National Museum.

Family THEREVIDÆ.

Psilocephala pruinosa, n. sp.

Black, the first two joints of antennæ, the halteres, femora, tibiæ and base of tarsi, yellow, venter of abdomen except at base, and the genitalia, reddish yellow, frontal triangle and face whitish pruinose, the tubercle above the antennæ and pair of tubercles below them polished; first joint of antennæ rather slender, slightly longer than the other two taken together; thorax gray pruinose, scutellum at base velvet black, the remainder gray pruinose, bearing four bristles; abdomen dorsally silvery-white pruinose, prolonged ventrally at the hind angles of the second and third segments, the broad hind margins of these segments white, hairs of abdomen and pleura chiefly white; wings hyaline, the base and costal cell yellowish, a brown cloud in base of first posterior cell and on cross-vein at base of the second, a large, indeterminate brownish

cloud near apex of wing, extending from slightly before apex of second vein to middle of second submarginal cell; fourth posterior cell closed and rather long petiolate. Length 6 mm.

A male specimen from Granada, Nicaragua.

Type.—No. 7795, U. S. National Museum.

Family CONOPIDÆ.

Conops pallifrons, n. sp.

Head yellow, occiput, except the upper and lower part and the sides on the lower half, black, front at insertion of antennæ narrowly margined with brown, a brownish streak below each eye in the male; antennæ reddish, the upper edge of the third joint and greater part of the second, black, the second joint subequal in length to the third; proboscis about one and one-half times as long as the head, reddish, the ends black; thorax black, a golden-yellow pruinose spot borders each humerus on the inner side, pleura crossed in front of middle coxæ by a yellowish pruinose band of well-defined outlines, a yellow pruinose spot on the hypopleura; abdomen black, sides of the second segment in the male reddish, broad base of the third yellow, second segment narrow, with nearly parallel sides, slightly longer than the third in the male, apices of male genitalia yellow; wings brown from costa to third vein, also along the third vein in first posterior cell and along fifth vein in discal cell except toward its apex, remainder of wings hyaline; halteres yellow; legs reddish brown, broad bases of tibiæ yellowish-white, tarsi and hind femora chiefly black. Length 6 to 8 mm.

A specimen of each sex from Chiuandega and San Marcos, Nicaragua. Also a male collected at San Rafael, Vera Cruz, Mexico, July 3, by Mr. C. H. T. Townsend.

Type.—No. 7796, U. S. National Museum.

Family TACHINIDÆ.

Paradidyma orbitalis, n. sp.

Black, the second joint of antennæ and broad base of the third, also the palpi and apex of proboscis, yellow; vertex one and one-half times as wide as either eye, one pair of orbital bristles, frontals descending nearly to the arista, a row of bristles extends from the lowest frontal just outside of the facial ridges to lower end of eyes, becoming stouter toward the lower end of the row, vibrissæ on a level with front edge of oral margin, two bristles above each; eyes bare, antennæ as long as the face, the third joint about eight times as long as the second, arista thickened on the basal three-fifths, the penultimate joint as broad as long; face in profile strongly convex except on the lowest fifth, cheeks one-third as wide as the eye-height; mesonotum grayish pruinose and with two broad black vittæ, three pairs of postsutural dorsocentral bristles, two sternopleurals, scu-

tellum bearing three marginal pairs; abdomen polished, narrow bases of last three segments whitish pruinose, these segments bearing only marginal bristles; fifth joint of front tarsi not compressed, of nearly an equal width, front pulvilli very short; wings hyaline, third vein bristly almost to small cross-vein, the others bare, first posterior cell short-petiolate. Length 4 mm.

A male specimen from Chinandega, Nicaragua.

Type.—No. 7797, U. S. National Museum.

***Hypostena gracilis*, n. sp.**

Black, the face, cheeks, first two joints of antennæ and broad base of the third, first three abdominal segments except a dorsal vitta and the base of the first dorsally and apex of the third, also the coxæ, femora and tibiæ, yellow, the femora and tibiæ tinged with brown; vertex about one-third as wide as either eye, frontals descending slightly below base of second antennal joint, antennæ four-fifths as long as the face, the third joint only slightly longer than the second, arista thickened on the basal third, the penultimate joint slightly longer than broad; vibrissæ on a level with front edge of oral margin, two bristles above each, face strongly retreating, concave, the cheeks one-fifth as wide as the eye-height, no orbital bristles; thorax yellowish-gray pruinose, mesonotum marked with four black vittæ, three sternopleural bristles; abdomen yellowish pruinose, apices of the first three segments polished, second and third segments bearing only marginal bristles, the fourth with a marginal and a submarginal row; front tibiæ subequal in length to the first three joints of their tarsi, pulvilli greatly elongated; wings hyaline, third vein bearing two bristles near the base. Length 6 mm.

A male specimen from Chinandega, Nicaragua.

Type.—No. 7798, U. S. National Museum.

Family HETERONEURIDÆ.*

***Chætoclusia*, n. gen.**

Near *Heteromeriugia* but the first vein bristly on the apical three-fifths, etc. Two pairs of vertical bristles, three of orbitals, ocellars minute, no postverticals, no bristles on the frontal vitta, vibrissæ stout, antennæ short, porrect, third joint sub-orbicular, somewhat longer than the second, arista subapical, densely short-plumose, eyes oblique, nearly twice as high as long, cheeks about one-twelfth as wide as the eye-height, face perpendicular, proboscis short and robust, palpi well developed; thorax bearing two pairs of dorsocentral bristles, two pairs of supra-alar, one humeral, two posthumeral, one mesopleural and one sternopleural, scu-

* The new name *Clusiodes* is hereby proposed for *Heteroneura* Fallen (Agromyzides Sueciæ, 1823) which is preoccupied by *Heteroneura* Fallen (Spec. Ent. Dipt. Exhib., 1810). the latter a synonym of *Callomyia* Meigen (1804) in the family Platyppezidæ,

tellum bearing a subapical pair and a pair of very short bristles in front of them; tibiæ without preapical bristles; auxiliary vein distinct but extending rather close to the first, costa not spined, extending slightly beyond apex of third vein, hind cross-vein about its own length beyond the small, first posterior cell not narrowed outwardly, second basal cell separated from the discal, anal cell complete, rounded at its apex, sixth vein not reaching the wing-margin.

Type: The following species:

***Chætoclusia bakeri*, n. sp.**

Head and its members yellow, polished, the antennal arista and an ocellar dot black, a brownish spot on outer side of third antennal joint; thorax yellow, sides of mesonotum black, prolonged downward in front of and behind each wing, and inward at each end of the mesonotum, the two ends connected by a second black vitta; scutellum yellow, the sides at base brownish; abdomen black, the extreme base, a pair of spots at bases of segments four to six, the genitalia and venter, yellow; legs yellow, basal half of middle or hind tibiæ usually brownish, femora devoid of bristles, middle tibiæ bearing a stout apical spur on the inner side and an apical bristle on the outer side; wings hyaline, apex brownish, this color extending to middle of last section of third vein, an indistinct brownish cloud covering the small and hind cross-veins, last section of fourth vein about seven times as long as the preceding section; halteres yellow; all hairs and bristles yellowish. Length 4 mm.

Two male and two female specimens from Chinandega and Granada, Nicaragua.

Type.—No. 7799, U. S. National Museum.

Family SAPROMYZIDÆ.

***Sapromyza varia*, n. sp.**

Black, the antennæ and sides of face yellowish brown, broad hind margins of the abdominal segments and middle of the first one yellow, the halteres, tibiæ and tarsi except apices of the latter whitish, all hairs and bristles black; head opaque, grayish pruinose, a velvet black spot near middle of each cheek, contiguous to the eye, third joint of antennæ elongate oval, artista long-plumose; thorax opaque, gray pruinose, marked with four brown vittæ, the outer pair interrupted at the suture; abdomen polished, the broad hind margins of the first four segments thinly grayish pruinose, the fifth segment with four gray pruinose spots; wings grayish hyaline. Length 4 mm.

A single specimen from Chinandega, Nicaragua.

Type.—No. 7800, U. S. National Museum.

***Sapromyza albipes*, n. sp.**

Head yellowish, the face, cheeks, sides of occiput and the mouth parts whitish, center of occiput brown, frontal vitta bordered with brown, a

velvet black spot at each lower corner of the front; antennæ on the two basal joints brown, the third joint yellow, elongate oval, arista very long-plumose; body black, pleura tinged with yellow, apex of scutellum, base of abdomen and greater part of the genitalia, yellow; thorax bluish gray pruinose and marked with three brown vittæ; abdomen polished, a pair of lateral, gray pruinose spots on each segment; legs and halteres whitish; wings hyaline, hind cross-vein broadly bordered with brown, last section of fourth vein five times as long as the preceding section. Length 2 mm.

A male specimen from Granada, Nicaragua.

Type.—No. 7801, U. S. National Museum.

***Sapromyza triseriata*, n. sp.**

Yellow, the last four abdominal segments each marked with three black dots, the hairs and bristles black. Third joint of antennæ noticeably longer than wide, arista pubescent. Thorax yellowish pruinose, the scutellum and abdomen polished. Wings grayish hyaline, unmarked. Length 2 mm.

A single specimen from Chinandega, Nicaragua.

Type.—No. 7937, U. S. National Museum.

Family ORTALIDÆ.

***Euxesta juncta*, n. sp.**

Head and its members yellow, the occiput except the lower edge, also the sides of the vertex and an ocellar dot, dark green, the hairs and bristles as also the antennal arista, black; thorax dark green, mesonotum grayish pruinose; scutellum yellow; abdomen dark green, the first two segments and base of the third yellow; legs yellow; wings whitish hyaline, marked with four brown cross bands, the first two are isolated, the other two are narrowly connected along the costa and again by an oblique streak near the middle of the first posterior cell; the first band is on a line with the humeral cross-vein, the second is very broad and passes just before the small cross-vein, the third passes over the hind cross-vein, while the fourth band borders the apex of the wing to slightly below apex of fourth vein; halteres yellow. Length 3 mm.

A male specimen from Granada, Nicaragua.

Type.—No. 7802, U. S. National Museum.

***Euxesta fenestrata*, n. sp.**

Head yellow, the occiput except middle of upper part and the lower edge, also the sides of the vertex and an ocellar dot, greenish black; antennæ and mouth parts yellow, the labella brown; thorax dark green, humeri reddish, scutellum yellow, abdomen reddish yellow, metallic, the ovipositor blackish; legs, including the coxæ, yellow; wings brown, the base to proximal end of discal cell whitish hyaline except a brown cross-band on a line with the humeral cross-vein, a whitish, subtriangular spot

extends from costa just beyond apex of first vein to the discal cell just beyond the small cross vein, a round spot of the same color in the submarginal cell near its middle, crossing this cell and encroaching slightly on the marginal cell, a smaller round spot in the first posterior cell slightly before the hind cross-vein, a subtriangular spot crosses the second posterior cell at its middle and extends a short distance into the first posterior cell; finally a similar spot crosses the third posterior cell a short distance before its apex and extends over half way across the discal cell; halteres light yellow. Length nearly 3 mm.

A female specimen from Champerico, Guatemala.

Type.—No. 7803, U. S. National Museum.

Family TRYPETIDÆ.

Icterica apicalis, n. sp.

Head yellow, frontal vitta reddish yellow, hairs and bristles black, the hairs on the front and a row of flattened bristles around upper half of occiput, also a pair in front of the vertical bristles yellowish white; body dark reddish yellow (apparently injured by moisture) varied with lighter yellow, the last segment of the abdomen chiefly black; scutellum bearing four bristles; legs reddish yellow, the tibiæ and tarsi lighter yellow; wings narrow, of nearly a uniform width, dark brown, the central portion from base of discal cell to slightly beyond its apex marked with about 34 yellow dots and small round spots, a yellow streak extends from apex of first vein obliquely into the submarginal cell, a second yellow streak extends from the extreme base of the wing through the anal and lower edge of the second basal cell and into the bases of the discal and third posterior cells, enclosing a brown spot in the discal cell and cutting off a second brown spot in the upper corner of this cell; the yellow coloring is prolonged as a narrow, interrupted border to the fourth vein nearly to the apex of the discal cell; extreme apex of wing and four drops along the hind margin whitish hyaline, that at the apex with the inner edge almost straight, extending from about midway between apices of the second and third veins to a short distance below apex of fourth vein; of the four hyaline drops along the hind margin of the wing, one is near the middle of the axillary cell, one is at the lower corner and a second is above the middle of the third posterior cell, while the fourth is below the middle of the second posterior cell; of the yellow dots and spots mentioned, only two are in the second posterior cell, situated near its inner upper angle, while the third posterior cell contains only one, situated slightly beyond and above the middle of the cell; halteres yellow. Length 5 mm.

A male specimen from San Marcos, Nicaragua.

Type.—No. 7804, U. S. National Museum.

Family EPHYDRIDÆ.

Notiphila frontalis, n. sp.

Black, the palpi, third joint of antennæ except the upper edge, knees, last two pairs of tarsi and the halteres, yellow; front yellowish-gray pruinose and with a pair of broad, velvet-black vittæ which converge toward their lower ends which are as widely separated as the antennæ, face golden-yellow pruinose; thorax yellowish-gray pruinose, a brown vitta above middle of pleura and five on the mesonotum, the median three forked near the middle, the forks united, three and three, at the posterior end of the thorax; scutellum yellowish-gray pruinose and marked with four brown vittæ; abdomen olive-gray pruinose, segments two to five each marked with a pair of subtriangular black spots which cross the segment near its middle and at its base are prolonged to the lateral margin; wings hyaline. Length 2 mm.

Three specimens from Managua and Granada, Nicaragua.

Type.—No. 7805, U. S. National Museum.

Family GEOMYZIDÆ.

Scutops, n. gen.

Near *Opomyza*, but the antennal arista is very long plumose, the face subtrigonal, no dorsocentral bristles on the thorax in front of the suture, etc. Head longest along the under side, front wider than long, bearing two pairs of vertical bristles and one pair each of postvertical, ocellar and orbital bristles; face somewhat shield shaped, hollowed out in the middle and elevated into a low ridge on each side and around the narrowed lower end, no vibrissæ; antennæ not quite reaching middle of face, the first joint very short, the second rather long and broad, the third slightly longer but narrower than the second, somewhat pointed at the apex, the arista dorsal, inserted near the base of the third joint, sparsely but very long plumose (nearly as in *Drosophila*); eyes reniform, over twice as high as long; cheeks about one-tenth as wide as the eye-height; proboscis short and robust, palpi spatulate; occiput strongly concave. Thorax bearing two pairs of dorsocentral bristles, two supra-alar, two posthumeral, one humeral, one sternopleural, pleura otherwise devoid of bristles, scutellum bearing four. Auxiliary vein absent except toward its base; second basal and anal cells large, sixth vein prolonged almost to the wing-margin, anal angle of wings strongly developed. Tibiæ devoid of preapical bristles.

Type: The following species:

Scutops fascipennis, n. sp.

Yellow, apices of palpi, two broad vittæ on the mesonotum, the metanotum except the sides, the abdomen and two interrupted bands on each tibia, black; the face, a vitta along the hind margin of each eye and one

extending from each humerus to the wing densely white pruinose, body elsewhere and the front polished, the mesonotum somewhat scabrous; hind margin of wings broadly grayish hyaline, base of the remainder yellowish, changing to brown outwardly, a white fascia crosses the wing midway between the hind cross-vein and the tip of the wing, the latter narrowly bordered with whitish; second vein extending rather close to the first and to the costa. Length, 3 mm.

Three specimens from Chinandega, Nicaragua.

Type.—No. 7806, U. S. National Museum.

Family OSCINIDÆ.

Chlorops capillata, n. sp.

Yellow, the upper apical angle of the third antennal joint, an ocellar dot, a dot behind and another below each humerus, black, apices of tarsi brown, mesonotum marked with three reddish yellow vittæ, antennal arista except at base white. Front rather strongly produced forward, frontal triangle polished, almost wholly covered with short hairs, without a median furrow, unusually broad, the sides strongly convex, extending to lower edge of the front where they form a blunt point; third joint of antennæ slightly longer than wide, the upper edge concave, the lower convex, the apex bluntly rounded; cheeks about one-fifth as wide as the eye-height. Body somewhat polished, not pruinose, the scutellum convex above. Wings hyaline, third and fourth veins diverging, hind cross-vein nearly three times its length beyond the small. Length 2 to 3 mm.

Three specimens. Granada, Nicaragua; Georgia, and North Carolina; the specimens from the two last-mentioned localities were collected by H. K. Morrison.

Type.—No. 7938, U. S. National Museum.

SOME NEW OSMIINÆ IN THE UNITED STATES NATIONAL MUSEUM.

By E. S. G. Titus.

Ashmeadiella schwarzi, n. sp.

♀.—Length 5 mm. Black, clothed with white pubescence, punctuation very dense and regular, more separate on thorax dorsally. Head, except occiput, densely clothed with long pubescence, thorax bare discally, scutellum with sparse pubescence, abdominal fasciæ regular and distinct, last segment with fine short hair. Legs with exceptionally sparse pubescence, tarsi slightly fuscous; mandibles tipped with red.

♂.—3.5-4.5 mm. Closely resembles the female, more stoutly built; tarsi, especially claw-joint, and claws fuscous. Apical abdominal teeth all short, the lateral teeth sharp, middle teeth rounded; all the teeth are

ferruginous and the color extends back of the lateral teeth onto the segment for a *very* short distance. Red color on the mandibles extending over a greater area than in female.

Hab.—♀, Chiricahua Mts., Ariz., May 30 (H. G. Hubbard); ♂, Catalina Springs, Ariz., April 14 (Hubbard and Schwarz); ♂, Ariz., 2546, Baker collection; "Tucson, Ariz., June 10, 1897 (R. E. Kunze)."

Type.—♀ and ♂, No. 6855, U. S. National Museum.

Ashmeadiella coquilletti, n. sp.

♀.—Length 7.5 mm. Black, head very large, punctures dense and of medium size on head and thorax, finer and closer on abdomen. Cheeks, sides of face, pleura, legs (except tarsi beneath), with white pubescence. Remainder of pubescence dull ochraceous, rather pale on bands of abdomen and ventral scopa. Punctures of clypeus very close, apical margin faintly crenulate; flagellum black, faintly fuscous beneath; mandibles black with a red band back of teeth, tegulae black with a ferruginous spot, nervures and stigma all dark; claws reddish; second recurrent nervure not quite reaching to tip of second submarginal cell.

♂.—Length 8 mm. Closely resembles the female. Pubescence of face denser and all white; of occiput and mesothorax very sparse, of metathorax dense and ochraceous; sides of thorax with dense white pubescence, bands on abdomen very distinct. Mandibles black, except for a red spot above near base; front tarsi fuscous, middle and hind tarsi faintly colored, especially beneath; spurs black. Lateral teeth at apex of abdomen short and pointed, middle teeth long, narrow, and rounded at tips; last dorsal segment with scattered white pubescence. Abdominal bands on segments 2 and 3 continued on venter.

Hab.—♀, San Diego Co., California, August 26, 1891 (collection W. J. Fox); ♂, San Diego Co., California (D. W. Coquillett).

Type.—No. 6877, U. S. National Museum.

Ashmeadiella rufipes, n. sp.

♀.—Length 7.5 mm. Head, thorax, and abdomen black, front legs black suffused with red; middle femora and hind legs red, hind tarsi with sparse black markings; tegulae ferruginous in front, black behind; nervures black except for a short distance near base where they are reddish-yellow; mandibles broad, very dark, tinged with red above and clothed with white hair. Pubescence rather dense and white, especially on clypeus. Thoracic disk almost bare. Punctuation dense on head, more separate on thorax dorsally, and fine and dense on abdomen.

Hab.—San Diego Co., California, August 30, 1891 (D. W. Coquillett).

Type.—No. 6861, U. S. National Museum.

Very much resembles the preceding species, but readily separated by the color of pubescence and legs.

Ashmeadiella curriei, n. sp.

♀.—Length 5.5 mm. Black, rather stout, closely finely punctured. Pubescence of face (except sides), clypeus, occiput, thoracic dorsum, tibiae and tarsi ochraceous; of sides of face, cheeks, pleura, thorax beneath, femora, abdominal bands and ventral scopa white, mandibles sparsely fringed with long yellow hairs. Antennae short, jet black, clypeus at apex faintly emarginate, fringed with very short white pubescence, two outer mandibular teeth ferruginous, claws and claw joints of tarsi ferruginous; tegulae punctured, black with a faint reddish tinge, nervures and stigma black, second marginal narrowed fully one-half above, second recurrent nervure reaching second submarginal cell one-fifth length of cell from tip; tibial spurs black.

Hab.—Kaslo, British Columbia, June 11, 1903 (R. P. Currie).

Type.—No. 6876, U. S. National Museum.

May be separated from *A. prosopidis* Ckll., *A. cactorum* Ckll. and *A. meliloti* Ckll., by the absence of white pubescence on the clypeus and thoracic dorsum, lack of red on legs and from all but *A. prosopidis* by its size.

Ashmeadiella gillettei, n. sp.

♀.—Length 6-7 mm. Stout, but not as broad as *A. californica* Ashm. Densely, finely punctured. Head and thorax black, mandibles black with faintly reddish tips, flagellum ferruginous beneath; claw-joint and claws of all the legs reddish, middle and hind femora reddish, sometimes with some black, hind tibiae reddish on inside. Abdomen black with first dorsal segment red excepting an irregular transverse blotch in center near hind margin, second segment red at sides and a third of the way toward the middle, third segment with a small red space on each side. Pubescence white, dense on face, cheeks and thorax, except disk, where it is present, but sparse and short. Ventral scopa and all the tarsi, beneath, with ochraceous pubescence, bands on abdomen very distinct, last dorsal segment with fine, short hairs; tibial spurs black; tegulae pale yellow with an anterior black spot.

Hab.—Ft. Collins, Colorado, June 8 and 20, 1900 (Titus).

Type.—No. 6880, U. S. National Museum.

Cotype in Colorado Agricultural College Museum. Three specimens.

There is in the National Museum collection a headless female from La Mesa, San Diego Co., California, 21 April, 1898 (L. O. Howard), that very closely resembles this species; the legs, however, are blacker and the 5th dorsal abdominal segment is also densely clothed with fine white pubescence.

Hoplitis sambuci, n. sp.

♀.—Length 8.5 mm. Black, abdomen shining black; stout, head fully as wide as thorax, strongly produced behind the eyes. Punctuation dense and exceedingly regular over the entire insect, including femora and tibiae. Pubescence varying from gray to white. Pubescence dense on face, cheeks, scutellum, and sides of thorax, very sparse on occiput and thoracic disc. Front legs with rather dense pubescence, that on middle and hind legs shorter and sparser. Dorsal abdominal segments 1-5 with snow-white apical hair bands broadly interrupted (rubbed?) in the middle, 6th segment with short white pubescence. Ventral scopa dense and white. Antennae black, scape somewhat enlarged, mandibles jet black, grooved externally, with three teeth, the outer one slightly longer and more pointed, the second and third separated by a shallow curve; clypeus truncate; tibial spurs black, spine at apex of front tibia strongly produced. Labial palpi four jointed, second joint $1\frac{1}{2}$ times as long as first, first two joints very slender, third and fourth stout subequal, maxillary palpi five-jointed, first stout and globular, third longest, equal to 4 + 5, two and four subequal, five slender, short.

♂.—Length 8.5 mm. Black, closely resembling female, facial pubescence whiter and denser, thoracic pubescence cinereous and dense; abdominal bands present on segments 1-6, interrupted in the middle, sixth segment narrowly ferruginous apically, dentate laterally; seventh segment truncate, broad, curving laterally to its base; sides of abdomen and last segment fringed with long, white pubescence; ventral segments neither enlarged or toothed. Antennae black, flagellum brown beneath, all the flagellar joints strongly crenulated, last joint hooked.

Hab.—Pullman, Wash., 2 ♀♀ (May 7); ♂ (May 14); all reared from stems of *Sambucus glauca*, by C. V. Piper.

Type.—No. 6860, U. S. National Museum.

I have examined the type species of the genus *Hoplitis* Klug (*Osmia adunca* L.) and feel sure that this species and *Alcidamea truncata* Cress. belong therein. It can be readily separated from *A. truncata* by size, form, and pubescence. The antennae in *Hoplitis* are quite varied, but the majority of species have deformed antennae.

Acanthosmiades ashmeadii, n. sp.

♂.—Length 10 mm. Head and thorax dull blue, abdomen shining steel-blue. Head and thorax disproportionately large for the abdomen, head as wide as thorax, abdomen slender. Punctuation confluent on head and thorax, dense and fine on abdomen. Pubescence of face, cheeks, occiput, borders of thoracic dorsum, and sides of thorax dull white in some places discolored with yellow, of abdomen very sparse, but where occurring is short and black; on dorsal segments 3-6 it can be plainly seen from the side, beneath the sides of the abdomen are fringed with black

hairs. Antennæ bicolored, scape black, flagellum pale testaceous, excepting a black tip to the flattened last joint; mandibles black; outer tooth long and sharp; tegulæ blue with a large fuscous spot; wings hyaline, nervures and stigma black; legs very stout, front and middle pairs blue-black with fuscous tarsi, hind pair brownish-black, tarsi fuscous, hind femora swollen at base, hind tibiæ very large, greatly swollen in the middle beneath, first hind tarsal joint swollen at base, tibial spurs large and black; sixth dorsal abdominal segment entire, not broadly rounded, seventh segment deeply bidentate; first ventral segment with a longitudinal central apical carina, testaceous in color, second segment with a testaceous strongly produced finger-like process, remainder of segment polished and blue.

Hab.—Dalles, Oregon (collection W. H. Ashmead).

Type.—No. 6859, U. S. National Museum.

This can be readily separated from *A. odontogaster* (Ckll.), by the antennæ, larger size, more strongly produced legs, and deeper color. In *A. odontogaster* there is a fine longitudinal groove on the second ventral segment which ends on the finger-like process, causing it to appear bifid at the tip; the first segment has no longitudinal carina.

—Mr. Benton exhibited a photograph from life, published in a recent number of an apicultural journal* labeled “Bees working on Chrysanthemums.” An examination of the picture showed him that the “bees,” so-called, are in reality drone flies (*Eristalis tenax*). It is well-known that these Syrphid flies have a habit of visiting chrysanthemums to feed upon the pollen, and this fly has been credited with effecting, to a greater or less degree, the fertilization of these blossoms. The plan of introducing it into countries where chrysanthemums do not seed has been seriously discussed. Drone flies have frequently been mistaken for bees. At the famous Utter trial† Mr. Benton, who was a witness for the National Bee-Keepers’ Association, brought with him a small case of insects containing workers, queens and drones of *Apis mellifera* and a number of drone flies. This case, when passed around, revealed the fact that the prosecution were unable to distinguish drone flies from bees with certainty, and therefore unable to prove positively that bees were the cause of the alleged damage. Even some of the skilled bee-keepers, to whom the

* The American Bee-Keeper, xiv, No. 3, p. 52, March, 1904.

† Described in Gleanings in Bee Culture for 1900 and 1901.

case of insects was shown privately before the trial, made mistakes in some instances in endeavoring to tell which were bees and which flies.

—Dr. Dyar presented the following paper :

ADDITIONS TO THE LIST OF NORTH AMERICAN LEPIDOPTERA, No. 2.

By HARRISON G. DYAR.

Family RIODINIDÆ.

Apodemia hepburni Godman and Salvin.

Mr. Oslar sent me a pair which he took in the Patagonia Mountains, Arizona. The male agrees with the description in the *Biologia Centrali-Americana*, but is rather smaller than the figure. The female has more white spots than the male. The form comes extremely close to *palmerii* Edw., which I at first thought it to be, till Mr. Oslar called my attention to the difference.

Family NOCTUIDÆ.

Hadena multicolor, n. sp.

Thorax blackish brown, lighter centrally, collar whitish in front; abdomen brownish gray. Fore wings variegated in ochraceous, red brown, blackish brown and white. The ground is ochraceous, appearing irregularly at base, in the elongate orbicular, in the t.-p. line opposite the cell and at apex, elsewhere obscured by dark red brown shades. Lines blackish, clouded, t.-a. outwardly oblique, t.-p. bent over cell with minute light points on the veins. Reniform ringed in white, showing a distinct spot at the outer side of the constriction; claviform black outlined, obscured in a blackish shade which irregularly fills the median space. Subterminal line pale, waved, obscure, terminal space shaded in black and running inward to t.-p. line opposite cell and on submedian fold. Hind wing nearly entirely blackish shaded over pale ochraceous. Expanse 43 mm.

One specimen, Victoria, B. C. (E. M. Anderson).

Type.—No. 7831, U. S. National Museum.

Allied to *vultuosa* Grote, but overspread with dark shadings while the reniform is contrasting white as in *apamiformis* Grote.

Hadena geminimacula, n. sp.

Lustrous blackish brown, brown or reddish, the markings all present and arranged as in *pluviosa* Walker, but not contrasted, something as in *ethnica* Sm., though less extreme. Lines geminate, crenulate, pale filled; subterminal broken into a series of pale dots, edged with black cusps within, its course straighter than in *pluviosa*. Ordinary spots outlined

in black, the reniform without any white except two little specks at its lower extremity between veins 3 to 5, but these specks are bright and contrasting. Hind wing blackish outwardly, pale at base. Expanse 47 mm.

Five specimens, Pecos, New Mexico, August 9 and 14 (T. D. A. Cockerell), Garfield Co., Colorado (D. Bruce).

Type.—No. 7832, U. S. National Museum.

The species is near *pluviosa*, distinguished therefrom by the smoother colors and the restriction of the white marking of the reniform. The two specimens from Mr. Cockerell are nearly black; two from Mr. Bruce are more brownish, possibly due to the specimens being older; the third specimen from Mr. Bruce is reddish brown. The three specimens from Mr. Bruce have been in the National Museum collection ever since Dr. J. B. Smith arranged it, the brown ones under the label *pluviosa* Walker, the red one under *lateritia* Hübner.

Tæniocampa terminatissima, n. sp.

Grayish clay color, shining; terminal space contrasting, ashen, separated by a light subterminal line which is distinct and perfectly straight from just below apex to before anal angle. Wing otherwise a little shaded, darkened before the subterminal line, lighter near the costa, but the extreme costal edge dark. Lines fine, linear, obliterate, dark, crenulate, the t.-p. with minute points on the veins. Orbicular represented by a black point; reniform large, illy defined, stained with rusty brown, with a black mark filling its lower third. Median shade line indicated; a terminal row of black points. Hind wing dark gray. Expanse 30 mm. The vestiture is hairy.

Described from one ♀, Las Vegas, New Mexico (C. P. Gillette.)

Type.—No. 7833, U. S. National Museum.

Amiana, n. gen.

Head subprominent, eyes large round, naked, front strongly conically produced, smooth; tongue distinct, palpi short, but exceeding front, scaled, third joint small; antennæ simple in both sexes. Legs moderate, normal, tibiæ unarmed, unmodified; vestiture scaly, without tufts. Wings rather wide, accessory cell present on fore wings; vein 5 of hind wings distinct, remote from 4, arising from the cross-vein half way between center and lower angle of cell.

Type: *A. niama*.

Judging from the figures in the Biologia Centrali-Americana *Miana pulchra* Druce and *M. zonella* Druce belong to this genus.

***Amiana niama*, n. sp.**

Deep grayish brown; fore wings relieved by an ochereous reddish shade in basal space and before anal angle, the latter sometimes forming a distinct but diffuse spot. Basal and t.-a. lines black, single, waved; a black median shade line; t.-p. line whitish, black edged, waved, excurved gently over reniform and inward on submedian fold; subterminal line a black shade, limited by whitish without, produced at veins 1, 3, 4, and 6; a row of terminal black dashes; claviform an ochereous point; orbicular black ringed, pale filled, small; reniform distinct, constricted, white and black ringed, concolorously filled; costa with white dots subapically. Fringe and hind wings blackish-brown. Below dark, the hind wings with three faintly darker lines. Expanse 24-25 mm.

Eight specimens, Huachuca Mountains and Nogales, Arizona (E. J. Osler).

Type.—No. 7834, U. S. National Museum.

***Bomolocha chicagonis*, n. sp.**

Brownish gray; t.-a. line obsolete, the wing obscured with dark brown up to the straight, slightly curving, oblique t.-p. line. Beyond lighter, lightest just next the t.-p. line; subterminal line subpunctiform, whitish, defined by a dark shade within. Ordinary spots wanting. Hind wing pale, grayish shaded. Expanse 28 mm.

One ♀, Chicago, Ill. (A. Kwiat).

Type.—No. 7835, U. S. National Museum.

Near *umbralis* Smith, but lighter, the t.-p. line more oblique, subterminal more remote from the edge and fused with its accompanying shade, no black dots on the ordinary spots.

A second specimen from Turtle Mountains, N. Dak. (A. H. Verrill), is the same but much paler, being pallid whitish ochraceous. I call it variety *perpallida*.

Type.—No. 7836, U. S. National Museum.

Family GEOMETRIDÆ.

***Sciagraphia gilletteata*, n. sp.**

Warm reddish gray; t.-a. and t.-p. lines broad, thick, upright from the internal margin, not reaching costa, light orange brown with pale edges. Discal dot dark; terminal space shaded in dark brown, darkest next the t.-p. line and separated therefrom by a black line. Hind wing with a faint discal dot and trace of an orange band above anal angle. Below washed with vermilion on costa and veins. Expanse 27 mm.

One ♂, Colorado (C. P. Gillette).

Type.—No. 7776, U. S. National Museum.

Resembles *continuata* Walk., and *snoviata* Pack., but the two thick, upright bands are orange brown, not black.

Tracheops bolteri Hulst.

I have received this species from Las Vegas (C. P. Gillette) and Mesilla Park, New Mexico (T. D. A. Cockerell), the specimens being, respectively, a ♀ and a ♂. Hulst described the form from a single ♂ from Mr. Bolter's collection and, in placing the genus in his synopsis, he made some of his characteristic assumptions, viz, that the female had simple antennæ and no fovea on fore wings below, when he had never seen a female. In this case he is proven to have been right. I do not detect the fovea and the antennæ are not pectinated, yet they are peculiar in that they are strongly serrate on the central part of the shaft. In coloration the ♀ resembles the ♂, but the hind wings have more pronounced markings, forming a rather definite scalloped mesial line. Fresh specimens are obviously pale olivaceous green, as this color is largely present in the ♀ specimen, though lost in the less well preserved ♂.

Family SESIIDÆ.

Parharmonia piceæ, n. sp.

Shining blue black; wings hyaline, colorless, fore wing with black costal edge, discal spot and outer margin, broad at apex. Antennæ black. Inner edge of patagia red; palpi at base within, fore coxæ without and irregular markings on inner sides of all tibiæ also red; fore tarsi reddish, middle tarsi reddish within, hind tarsi black. Abdomen with scattered red scales on the under surface, forming a defined double patch on the third segment, uniform black above. Expanse about 25 mm.

Three specimens, Hoquiam, Wash. (H. E. Burke), bred on *Picea sitchensis*; Keyport, Wash. (C. V. Piper).

Type.—No. 7837, U. S. National Museum.

This species may be referable to the genus *Sesia*, as the character of the anal tuft in the two sexes is the only diagnostic character that I can gather from Beutenmüller's tables to separate *Parharmonia* and *Sesia*. In either case it does not seem to coincide with any described species.

Family PYRALIDÆ.

Ulophora brunneella, n. sp.

Fore wings with 11 veins, 4 and 5 closely approximated at base, but separate, 6 from end of cell, curving downward, 7 and 8 long stalked, 10 close to the stalk but separate. Hind wings with 8 veins, 3 approximated to, but separate from the long stalk of 4 and 5; cell about one-fourth the length of wing. Labial palpi upturned far above vertex, third joint small; maxillary palpi small, filiform; ♂ antennæ simple, thickened; tongue strong; ocelli present; fore wings with a basal scale ridge.

Body dark purplish gray; fore wing long, squarish, purple gray, rather light, somewhat reddish in the lower part of median space. Basal space reddish below, costal part shaded in black. Scale ridge oblique, black, followed by a broad black space to the narrow, parallel, black inner line which is edged with paler without. Median space above clouded with black; discal dot diffused. Outer line strongly bent outward at veins 4-5, pale, narrowly black edged. Veins of terminal space black lined, the apex with a small dark shade; terminal line black; fringe plumbeous, shining, not metallic. Hind wing fuscous, subpellucid, fringe nearly concolorous. Expanse 24 mm.

One ♂, Tryon, North Carolina, May 25, 1903 (W. F. Fiske).

Type.—No. 7838, U. S. National Museum.

The species resembles *Pinipestis zimmermanni* Grote, but is smaller and the inner line of fore wing is much more oblique.

***Ulophora tephrosiella*, n. sp.**

Rather dark purplish gray. End of patagia and a streak in basal space rusty red. Scale ridge dark purplish, preceded by a lighter tint and followed by a rusty red shade. Inner line at about the middle of the wing, wavy, followed by a dark shade. Discal dots dark; outer line gently out-curved, pale, preceded and followed by a broad dark shade; terminal line dark; hind wings fuscous, lighter in the ♂; fringe pale. Expanse 13-14 mm.

Three specimens, Washington, D. C., August 27, 1894; bred from larvæ on *Tephrosia virginiana*. Department of Agriculture, Insectary No. 6323.

Type.—No. 7839, U. S. National Museum.

***Ortholepis gillettella*, n. sp.**

Fore wings with 11 veins, 4 and 5 separate, 10 separate; hind wings with 8 veins, 4 and 5 long stalked, cell moderate, counting to the origin of vein 3 fully half the length of the wing, to the center of cross vein over one-third. Labial palpi upturned, exceeding the vertex, third joint slender, half as long as second; maxillary palpi smoothly scaled; ♂ antennæ bent above base with a tuft of large scales in the bend; an erect ridge of scales preceding the transverse anterior line of fore wings. Dark blackish cinereous, shining. Lines a shade paler, distinct, the inner oblique, waved, the outer bent at cell and submedian fold, slightly crenulate, both edged with darker; a faint blackish line runs from inception of outer line on costa to median space on inner margin. Scale ridge black; the discal dots form a narrow black bar of raised scales; terminal edge black. Hind wings brown black. Below immaculate blackish. Abdominal segments above faintly whitish ringed at tips. Expanse 25 mm.

Described from one ♂, Colorado, probably from Fort Collins (C. P. Gillette).

Type.—No. 7840, U. S. National Museum.

Ambesa busckella, n. sp.

Fore wing with 11 veins, hind wing with 8; labial palpi erect, maxillary palpi small, filiform; ♂ antennæ slightly bent above base with a row of small brown teeth nearly hidden by scales in a groove within the bend. Head, palpi, thorax and base of fore wings pale whitish gray, tinged with ochraceous on the base of the wings. Following this is a broad black space, in the outer edge of which is the inner line, fine, white, zigzag angled; a diffused whitish spot on the inner margin just beyond. Outer part of wing pale gray, middle field faintly ochraceous tinged below. Discal spot large, black. Outer line white, sharply black edged, obscurely crenulate, bent in a little at end of cell; an abbreviated, oblique, wavy blackish line from the bend to below discal dot. Terminal line dotted, black. Hind wings pale fuscous. Expanse 20 mm.

One ♂, one ♀, Plummer's Island, Maryland, May 16, August 24 (Aug. Busck).

Type.—No. 7841, U. S. National Museum.

Meroptera liquidambarella, n. sp.

Fore wings with 11 veins, 4 and 5 short stalked, 10 short stalked with 8 and 9; ♂ antennæ with bend at base and small scale tuft; maxillary palpi with a large yellow tuft, concealed within the labial palpi. Head and thorax blackish gray; forewings with light gray ground of the color of *pravella* Grote, but this color appears not only on the inner line, but in the median space as well. Base reddish, dark, obscure; t.-a. line oblique, straight, of the ground color, followed by a broad black band and this by a narrow, slightly irregular one, which is shaded to the broad band on the costa. Discal dots more or less completely joined; a broken band beyond them and a clouded dot below, both in the light gray median space. T.-p. line narrow, pale, preceded and followed by a black shade, bent out in the middle but scarcely crenulate. A terminal row of nearly joined black dashes. Hind wings gray as in *pravella*. Expanse 16-18 mm.

Washington, D. C. Described from sixty-one specimens bred from sweet gum at the insectary of the Department of Agriculture, August, 1881 (no number) and May, 1893 (No. 5491).

Type.—No. 7842, U. S. National Museum.

A specimen was sent to the late Dr. Hulst several years ago and was determined by him as "*Salebria nubiferella* Rag. (??)." The specimen was not in good condition, being an undersized female, somewhat rubbed, so that the determination was not made at the best advantage. The species is not referable to *Salebria* on account of the venation; but, even so, it does not agree with the description of any of the species of that genus. In Ragonot's figure of *nubiferella*, the base is not red, and the course of the inner line is interrupted and different from the specimens before me.

Salebria triplagiella, n. sp.

Gray; fore wings rather dark, appearing granular from the pale scales mixed with darker; no reddish shades. Inner line whitish, oblique, irregularly dentate, a black border outwardly on costal half, inwardly on lower half; a small white shade nearly touching the line on the inner margin, followed by a diffuse black spot. Discal dots joined, large, black. Outer line rather coarsely crenulate, very slightly more incised at cell and submedian fold; a row of terminal dots. Hind wing fuscous, subpellucid, the edge darker, fringe whitish. Expanse 25 mm.

Described from one ♂, Winnipeg, Manitoba (A. W. Hanham).

Type.—No. 7843, U. S. National Museum.

The form comes near *annulosella* Ragonot, but the wings are more elongate, the markings less definite and rougher, while the outer line is scarcely incised at all on the submedian fold.

Pyla hanhamella, n. sp.

Palpi porrect, greenish metallic, white scaled below narrowly. Head and thorax black, slightly metallic; ♂ antennæ bent at base with very small scale tuft in the bend, of ♀ simple. Fore wings brownish black, the basal space only with a slight metallic reflection; median space washed with white scales. Lines gray white, rather broad, diffused, the inner oblique, slightly waved, the outer indented at cell and submedian fold. The grayish scaling in the median space is clustered over the cell and defines distinctly a large dark discal dot. Hind wings light brownish, darker on the edge, the fringe pale, almost whitish. Below pale sordid whitish, yellowish tinged, unmarked except for a trace of the outer line on the costa. Abdomen dark, ringed in pale at the ends of the segments and lighter towards tip. Expanse 22-24 mm.

Described from 3 ♂♂ and 1 ♀, Winnipeg, Manitoba, one dated June 27, 1900 (A. W. Hanham).

Type.—No. 7844, U. S. National Museum.

Pyla rainierella, n. sp.

Black; fore wings with scattered greenish metallic scales. Lines and discal dot without these scales, black, diffused, rather broad and near together. Inner line straight, nearly perpendicular; outer line bent outward in the middle. Hind wings and underside black. Expanse 16-17 mm.

Two ♂♂, Mt. Rainier, Washington (C. V. Piper).

Type.—No. 7845, U. S. National Museum.

The species of *Pyla* may be separated by the following table:

Fore wings without cross lines.

Wings long, size large (32 mm.).....*metallicella* Hulst

Wings less elongate, size smaller (25 mm.).

Iridescence coppery*scintillans* Grote

Iridescence bronzy green.....*æneoviridella* Ragonot

Iridescence greenish yellow, sexes unlike.....*æneella* Hulst

Fore wings with transverse lines.

These lines pale,

Lines white; wings with metallic lustre.....*bistriatella* Hulst

Lines grayish; wings without metallic lustre.

Dark fuscous beneath.....*incorruscella* Hulst

Light yellowish fuscous beneath*hanhamella* Dyar

These lines black.....*rainierella* Dyar

Megasis caudellella, n. sp.

♂ gray, pulverulent, lines whitish, straight, the inner line very slightly bent subcostally, the outer almost perfectly straight, both faintly blackish edged toward the median field. Discal spot black, more or less distinct; terminal line shaded black. Hind wings subpellucid pale gray, termen blackish narrowly, fringe pale. Expanse 30-32 mm.

♀ much smaller and more distinctly marked. Lines whitish, diffuse, nearly straight with broad distinct blackish borders within; discal dots separated by a whitish point. Hind wings as in the male. Expanse 20-22 mm.

Two ♂♂, two ♀♀, foothills above Golden, Colorado, May 13, 1901 (Dyar and Caudell).

Type.—No. 7846, U. S. National Museum.

Differs from the other species of *Megasis* of similar size in the straightness of the lines.

Megasis piperella, n. sp.

Fore wings with 11 veins, hind wings with 8, 4 and 5 long stalked; labial palpi moderate, drooping; maxillary, small, filiform. Male antennae simple; no lateral tuft on thorax. Fore wings elongate, narrow, apex depressed; light ashy gray; a diffuse ochraceous ray through the cell. Costa white on basal third, running to over half subcostally but not pure white being mixed with scattered cinereous scales. Discal dots black, separated by the end of the ochraceous ray. Veins slightly powdered in darker; lines absent. Hind wings moderately ample, subpellucid, pale fuscous tinted. Below like hind wings above. Expanse 32 mm.

One ♂, Pullman, Washington, May 15, 1898 (C. V. Piper). Washington Experiment Station No. 233.

Type.—No. 7847, U. S. National Museum.

This may be *Epischnia granitella* Rag., but I place it in *Megasis* in an effort to interpret Hulst's tables literally.

The species of *Megasis* may be separated as follows:

Fore wings elongate triangular, broad; hind wings very full and ample;
 ♀ markedly smaller than ♂.

Outer line irregular and indistinct or wanting, at least in the ♂.

♂ with numerous dots on the veins; ♀ with inner line
 waved.....*edwardsialis* Hulst

♂ without dots, a yellowish ray in submedian fold; ♀ with
 inner line straight, whitish.....*excantalis* Hulst

Outer line well formed, fairly distinct.

Outer line bent; palpi hairy.....*atrella* Hulst

Outer line straight; palpi normal.....*caudellella* Dyar

Without these characters.

Large species (33 mm.); cross lines obsolete.....*piperella* Dyar

Small species (15 mm.); cross lines present.....*cinctella* Hulst

Zophodia orobanchella, n. sp.

Wings trigonate, rounded, rather less elongate than usual. Gray, white and black scales rather evenly mixed. Inner line lost; outer black, broad on the costa, twice angled below becoming narrow and obsolete. Discal spot large, black, rounded. A fine black line runs through the middle of the cell from the discal dot, edged with white, most distinctly so below. The white and black scales costally are arranged indistinctly in lines. Termen nearly white, the terminal line diffusely dotted black. Hind wings pale fuscous, dark on the margin. Expanse 18-20 mm.

Three specimens, Wawawai, Washington, August, 1898 (C. V. Piper), reared from larvæ in the flowers of *Orobanche ludoviciana*, Washington Experiment Station No. 051.

Type.—No. 7848, U. S. National Museum.

Staudingeria olivacella, n. sp.

Fore wings narrow but triangularly widened; obscure sordid olivaceous, the costal edge diffusely white. Lines nearly obsolete, shadowy, dark gray, the inner line not definite, the outer retracted nearly to touch the small, obscure discal dots. Hind wings lightly gray shaded; fringe pale. Expanse 24 mm.

One ♂, Pullman, Washington, August 12, 1898 (C. V. Piper), Washington Experiment Station, No. 539.

Type.—No. 7849, U. S. National Museum.

Staudingeria perluteella, n. sp.

Fore wings with 11 veins, hind wings with 7 veins, antennæ simple, labial palpi obliquely ascending, long, third joint very small, deflexed, maxillary palpi with a long bunch of hairs at the tip, tongue distinct. Fore wings narrow, well angled and rather pointed, uniform pale luteous ochraceous, the lines and discal dot only indicated by faint shadows, not definite enough to describe. Hind wings, broad, rounded, fuscous gray, a little translucent, dark at the extreme margin, the fringe long and pale. Expanse 25 mm.

One specimen, Fort Collins, Colorado (C. P. Gillette).

Type.—No. 7850, U. S. National Museum.

Homæosoma reliquellum, n. sp.

Smooth, obscure cinereous, thickly dusted with white on costal half. Lines obsolete, the inner represented by three black dots, the upper and lower of which are very small, the middle one more outwardly placed; outer line indicated by an outward blackish shade, curved, regular and even. Discal dots black, joined into a large spot in the male, narrowly separated in the female. Hind wings whitish, gray tinted along costa and outer edge. Expanse 15-16 mm.

One ♂, one ♀, Center Harbor, New Hampshire, July 19, 1902 (H. G. Dyar).

Type.—No. 7851, U. S. National Museum.

Nearly allied to *Homæosoma mucidellum* Rag. but smaller, smoother cinereous, the outer line very vague and slightly curved, discal dots approximated or fused. I have *mucidellum* from Texas, Colorado (G. P. Gillette), Kaslo, British Columbia (Dyar and Caudell), Pullman, Washington (C. V. Piper), and Los Angeles, California (A. Koebele). The specimens vary much in size, but not in the characteristic markings.

Tacoma Hulst.

In his original description, Hulst says, "♂ antennæ simple," but changes this later, giving the ♂ a tuft of scales in the bend of antennæ. The genus would, therefore, fall as a synonym of *Nephopteryx* Hübner, as Ragonot shrewdly suspected;* but I think the section of *Nephopteryx*, with veins 4 and 5 of fore wings actually stalked (not approximate only), may properly be recognized as of generic value, under the name *Tacoma*. It will contain, of North American species, *feriella* Hulst, *subtinctella* Rag., and the following:

Tacoma nyssæcolella, n. sp.

Dark lilaceous gray; inner line rather oblique, pale gray, angled slightly centrally, preceded on inner margin by a subquadrate brown-black patch, followed outwardly by a triangular black patch on costa, joined to a narrow black line below. Discal dots joined, black; a large, diffuse, brown-black spot below, touching inner margin and outer line. Outer line pale, slightly excurved in the middle, very obscurely dentate, edged faintly and narrowly with black. Terminal line black; fringe gray. Hind wings pale fuscous. Expanse 16 mm.

One ♂, bred from *Nyssa multiflora*, issued August 14, 1894. "Collected near Bladensburg Road, D. C., in a tightly folded leaf.

* Mon. Phycit. et Gall., p. 205, 1893.

The larva was black, five-eighths of an inch long, the head yellow, retractile; thinly covered with short white hairs. The leaf was folded lengthwise and upwards, the edges tightly fastened together, giving the fold a very sharp edge, the entire leaf looking like a pod. Within the fold there is a web which holds the excrement suspended." (Chambliss.)

Type.—No. 7928, U. S. National Museum.

***Ephestia nonparilella*, n. sp.**

Head round, eyes large; labial palpi upturned weakly, second and third joints nearly equal, not reaching vertex; maxillary palpi filiform; tongue moderate; ♂ antennæ simple. Fore wing with 9 veins, all free; hind wing with 6 veins, 5 and 8 wanting, 3 and 4 separate, but approximate at base.

Fore wing long and narrow; pale gray, irrorate with black scales; lines black, distinct, contrasted, parallel, the inner at the middle of the wing, the outer at the outer fourth. Both are slightly oblique, parallel to the outer margin, straight, the inner edged within with white, the outer edged without and more distinctly so. Discal spots joined, black, touching a black cloud on costa. Hind wings whitish, subpellucid. Expanse 18 mm.

One ♂, Santa Rita Mountains, Arizona, June 7 (E. A. Schwarz).

Type.—No. 7929, U. S. National Museum.

***Psorosina*, n. gen.**

Fore wings with 11 veins, 4 and 5 separate, 8 and 9 stalked; hind wings with 7 veins, 2 at the angle of the cell, 3 and 4 stalked. ♂ antennæ bent above base with a tuft of scales in the bend; tongue moderate; labial palpi erect, recurved to vertex; maxillary palpi small, filiform.

Under this I place *hammondi* Riley and the following new species. Hulst puts *hammondi* in *Canarsia*, of which he says: "Close to *Psorosa* Zell., differing principally in the stemming of veins 4 and 5." But *Psorosa* has long wings with a scale ridge, while the palpi are long and porrect (European *dahliella* Tr.). In *ulmiarrosorella* Clem., veins 4 and 5 of fore wings are stalked and *Canarsia* must be restricted to this, including perhaps *graciella* Hulst, which I do not know.

***Psorosina angulella*, n. sp.**

Shining dark brownish gray; inner line broad, whitish, obscurely geminate, rather diffuse, the costal half oblique, the inner half straight. Discal dots black, joined in an oblique white cloud; outer line near margin, faint, pale, straight. Hind wing pale fuscous. Expanse 14 mm.

One ♂, Iowa (C. P. Gillette). Very close to *hammondi*, but the inner line is strongly angled. It may prove a variety of *hammondi*.

Type.—No. 7930, U. S. National Museum.

Passadena Hulst.

The type of this genus, *constantella* Hulst, is obviously synonymous with *Getulia flavidorsella* Rag. Ragonot defined *Getulia* from an African species, a ♀ only, and later referred to it his *flavidorsella*, first described under *Anoristia* from ♀♀ only. Whether the African species has the same ♂ characters as the American one is purely a matter of surmise at present and I therefore retain Hulst's generic term and remove *Getulia* from the North American list.

Passadena flavidorsella Ragonot.

I have the species from Los Angeles, Cal., May (D. W. Coquillett), Argus Mountains, Cal., May, 1891 (A. Koebele), Tucson, Ariz., March 13, 1898 (E. A. Schwarz), Catalina Springs, Ariz., April 10, 1898 (E. A. Schwarz), Oracle, Ariz., July 15 (E. A. Schwarz), Colora'o, New Mex., July 10, at light (T. D. A. Cockerell).

The maxillary palpi in the ♂ are pencil tufted and the species falls near *Etiella* Zell., but is distinguished therefrom by the shorter labial palpi.

Myelois fragilella, n. sp.

Fore wings with 11 veins, 4 and 5 stalked, 8 and 9 stalked; hind wings with 8 veins, 2 long before the angle of the cell, 4 and 5 stalked, cell long; tongue strong; labial palpi upturned, maxillary palpi filiform; ♂ antennæ simple.

Fragile and slender. Fore wings light gray, white mixed with cinereous and black; lines not contrasted, narrow, white, their blackish edges more conspicuous than the lines. Inner oblique, distinctly and strongly produced outward on submedian fold, blackish edged within. Discal dots elongate, well separated, blackish. Outer line minutely angled on discal and submedian folds, dark edged within. Terminal line of scattered dark scales. Hind wing translucent, pale fuscous outwardly. Expanse 21 mm.

One ♂, Pecos, New Mexico, at light June 21 (T. D. A. Cockerell).

Type.—No. 7931, U. S. National Museum.

Varneria, n. gen.

Fore wings with 9 veins, 3 and 4 stalked, 5 and 8 absent, 10 from the cell; hind wings with 6 veins, 2 near the angle of the cell, 3 and 4 stalked, 5 and 8 absent. Tongue distinct, scaled, but very short, about equalling the length of the head. Palpi upturned above vertex, second joint reaching vertex, third half as long as second or over.

Varneria postremella, n. sp.

Head, thorax and fore wings dark vinous red, the head, thorax and basal half of costa overspread with blackish. A blackish line follows the discal fold and spreads diffusely on the discal nervules. Terminal edge and fringe blackish. Hind wing dark fuscous, blackish on margin. Expanse 10.5 mm.

Three ♀♀, Kentucky, August (Aug. Busck), Plummer's Island, Maryland, July 1903 (Aug. Busck).

Type.—No. 7932, U. S. National Museum.

Peoria discostrigella, n. sp.

Fore wings with 11 veins or 10, 3 and 4 separate, 4 and 5 very long stemmed or coincident, 8 and 9 stemmed, 10 and 11 from the cell; hind wings with 7 veins, 2 before the angle of the cell, 3 and 4 very shortly stalked or separate, 8 distinct, the cell moderate, nearly half the length of wing. Tongue rudimentary; palpi very long, porrect; clypeus smooth.

Head, palpi and thorax whitish ocherous; fore wings pale ocherous, showing in a broad stripe from base to margin along submedian fold, elsewhere longitudinally lined with gray on the veins; a broad costal white stripe to apex; a long lanceolate white stripe along median vein from near base to near margin. Hind wings white, subpellucid, yellowish tinted. Expanse 28 mm.

Three ♀♀, Roswell, New Mexico, August 22 (T. D. A. Cockrell), Tucson, Arizona, July 21 (E. A. Schwarz).

Type.—No. 7933, U. S. National Museum.

Perhaps more properly referable to *Aurora* Rag. The venation seems unusually unstable.

Tolima cincaidella, n. sp.

Fore wings with 11 veins, 2 well before angle of cell, 3 before angle, 4 and 5 very shortly stalked, 8 and 9 stalked, 10 connate with the base of the stalk, 11 from the cell. Hind wings with 7 veins, 2 from the angle of the cell, 3 and 4 long stalked, 5 absent, 8 distinct. Tongue moderate, apparently about twice the length of the head; palpi very long, porrect and drooping; antennæ simple, lengthily ciliate.

Pale ocherous whitish, lines paler, obscure, defined by dusky edgings toward the median space. Inner line produced a little on costa, preceded by a very faint, russet patch on the inner margin. Discal dots blackish, separate. Outer line drawn inward subcostally, else even, a slight dentation indicated in the dusky border. The wing is all very pallid. Hind wing whitish, translucent. Expanse 27 mm.

Three specimens, all with the abdomens broken, but apparently males, Rock Spring, Wyoming (T. Kincaid).

Type.—No. 7934, U. S. National Museum.

Apparently falls in *Altoona* by Hulst's tables, as veins 4 and 5 are very shortly stalked; but on reading the text, it is seen that *Altoona* is not different from *Volusia*, both of which are regarded by Ragonot as synonyms of *Tolima* and have veins 3 and 4 of the fore wings distinctly stalked. The present species differs also from the generic type in the greater length of tongue.

Atascosa quadricolorella, n. sp.

Fore wings with 11 veins, 4 and 5 stalked, 8 and 9 stalked; hind wings with 7 veins, 2 at the angle of the cell, 3 and 4 long stalked, 8 very short. Tongue small, yet distinct; palpi obliquely ascending, the second joint enlarged at the tip, third about one-fourth the second.

Fore wing gray, powdered with white on costal third. Inner line white, narrow, arcuate, more oblique on costal half, without any indentations. Following it, a band, red-brown on costal half, ocher on inner half and spreading into a large blotch. An illy defined darker shade through the cell, cutting the brown band and touching the partly confluent discal dots. Outer line white, edged by black scales on both sides, a little excurved mesially and obscurely dentate. A terminal blackish diffuse line. Hind wings white, a fuscous line towards apex. Expanse 18 mm.

One ♀, Las Cruces, New Mexico (T. D. A. Cockerell).

Type.—No. 7935, U. S. National Museum.

Caudellia, n. gen.

Fore wings with 9 veins, 5 and 8 wanting, 3 and 4 separate; hind wings with 7 veins, 3 and 4 separate, 8 very short, cell normal, about half of wing. Tongue moderate, distinct; labial palpi obliquely ascending, third joint somewhat flexed, long, exceeding the front by twice the length of the head. Maxillary palpi very small, filiform. Ocelli present, minute; ♂ antennæ simple, a little irregular and flexuous above base. Fore wing with oblique scale tuft on costa below beyond base.

Allied to *Unadilla* Hulst.

Caudellia apyrella, n. sp.

Dark vinous brown, heavily overlaid with black. Fore wings with the markings obscured, vinous shaded; inner line a vague paler shade; a lighter patch on outer third of costa touching the obscure discal dots; a black shade at apex; terminal line black. Hind wing whitish, subpellucid, fuscous tinted. Fore wing pale ashen below; costal tuft vinous. Expanse 14-15 mm.

Two ♂♂, Plummers Island, Maryland, June and July, 1903 (Aug. Busck).

Type.—No. 7852, U. S. National Museum.

Caudellia albovittella, n. sp.

Fore wings with 9 veins, all separate, 5 and 8 wanting; hind wings with 6 veins, 3 and 4 separate; palpi porrect, the basal joint ascending, the

third moderate, slightly deflexed; costal fold on the under side with a tuft of scales in the male. Head and thorax dark purplish brown; fore wing vinous brown shaded in black. Inner line oblique, straight, white, and well contrasted, widened almost to a blotch subcostally. Outer line whitish, pale, illy defined, rather near the margin; discal dots small, black, succeeded by a few light scales. Hind wings subpellucid, fuscous at the margin. Expanse 13 mm.

One ♂, one ♀, Plummers Island, Maryland, July, 1903 (Aug. Busck).

Type.—No. 7853, U. S. National Museum.

Family COCHLIDIIDÆ.

Slossonella, n. gen.

Allied to *Heterogenea*, but with four spurs on the hind tibiæ. Palpi of ♀ curved, but very short, hardly exceeding the front. Head sunken, form rather slender. Fore wings with veins 8 and 9 stalked, 7 remote, 10 from the base of the stalk. Hind wings with no veins stalked.

Slossonella tenebrosa, n. sp.

Dark rusty brown, nearly chocolate color. Fore wings with two slender black lines the inner nearly straight, at middle of wing, faint, obsolete costally, the outer produced outward over the discal nervures, narrow, flexuous. Hind wings brownish black with light brown fringe. Expanse 21 mm.

One ♀, Jacksonville, Florida (Mrs. A. T. Slosson).

Type.—No. 7941, U. S. National Museum.

Family TORTRICIDÆ.

Eucosma crenana Hübner.

I have collected this European species at Kaslo, British Columbia, and bred the larvæ on willow. The specimens have been shown to Mr. W. D. Kearfott and Dr. C. H. Fernald, who are of the opinion that the species may be distinct from the European one. I cannot, however, see the slightest reason for it.

Eucosma solandriana Linnæus.

I have received this European species from Victoria, British Columbia, from Messrs. A. W. Hanham and E. M. Anderson. Three of the forms of this strikingly variable species are represented, the nearly unicolorous form, the dark one with white dorsal patch and the light one with brown dorsal patch. In Europe the larva is known to feed on willow and birch, and the same will probably be found to be the case in North America.

—The next paper was by Mr. Schwarz, entitled:

A NEW COCCINELLID ENEMY OF THE SAN JOSE SCALE.

By E. A. SCHWARZ.

Mr. C. L. Marlatt who lately visited Southern California found a small Coccinellid quite abundant on fruit trees infested by the San José Scale (*Aspidiotus perniciosus*), and reports that it is well known among the orchardists of Southern California as an efficient enemy of that Coccid. From a study of specimens submitted to me by Mr. Marlatt I find that they belong to the genus *Pseudoweisea* Cockerell. These minute Coccinellids, originally described by Dr. LeConte as *Pentilia* and subsequently referred by J. Weise to his genus *Smilia* (the name changed to *Epismilia* and finally to *Pseudoweisea* by Prof. Cockerell), all prey exclusively upon Diaspinæ. In former years they were quite rare in collections, but since economic entomologists have paid attention to the enemies of imported Coccids, it was found that they are in reality quite abundant.

Pseudoweisea suturalis, n. sp.

Rounded oval, convex; head and thorax nearly opaque, elytra shining. Head, thorax, underside and legs black; elytra brownish red with the suture narrowly black. Head but little wider than long, with the upper surface flattened. Prothorax forming a distinct obtuse with the elytra, oblique line at anterior angles distinct but not prolonged along the lateral margin, basal marginal line distinct at the sides but very fine at the middle, upper surface finely alutaceous and with sparse shallow larger punctures. Elytra not alutaceous, rather strongly but not densely punctured, sutural stria distinct throughout, but very fine near the base. The black color is usually confined to the narrow space between the suture and the sutural striae. Length 0.8 to 0.9 mm.

Type.—No. 7936, U. S. National Museum.

The National Museum has numerous specimens found by Mr. F. Maskew at Long Beach, Los Angeles Co., Cal., feeding on *Aspidiotus perniciosus*; and a long series of specimens bred by Mr. D. W. Coquillett from larvæ feeding on *Aspidiotus aurantii* at Los Angeles, Cal.

The species resembles in form of the body the eastern *P. missella*, but its head is narrower and the coloration different. More or less immature, or bred specimens have the sterna (excepting the metepisterna), and the abdomen brownish or reddish.

It may be that Mr. H. C. Fall's remarks on the occurrence of *P. (Smilia) ovalis* Lec.,* refer to *P. suturalis*. The former seems to be confined to the more southern parts of Florida and is readily known from the more elongate form of the body.

* Occas. Papers Cal. Ac. Sc., VIII, p. 85, 1901.

Mr. Coquillett has kindly placed at my disposal a copy of his field notes (written in 1892) referring to the larva and pupa of this species. These notes read as follows:

"No. 344.—Larva resembles fig. 364, page 432, of Packard's 'Guide to the Study of Insects.'

"Body 12 segmented, olive-brown in the younger ones, becoming salmon-brown in the older ones; head black, horizontal, depressed, about one-half longer than wide, one-half as wide as the first thoracic segment; the latter is longer than any of the other body segments and is marked with two black dorsal spots placed transversely; body widest at the third abdominal segment, last segment rounded behind, devoid of processes, furnished with a retractile proleg; body sparsely clothed with microscopic hairs each tipped with a minute translucent globule, mostly white but sometimes tinged with yellow; the six thoracic legs black; length 1.50 mm.

"Found several at Los Angeles, Cal., February 12, 1892, on orange trees infested with *Aspidiotus aurantii* and red spiders upon both of which they appeared to feed. In pupating the larval skin is worked back until the middle of the dorsum of the first five abdominal segments are exposed to view, but the sides of the fourth and fifth segments and the ends of the wing cases remain concealed by the old larval skin.

"The pupa varies in color from pale yellow to deep orange-yellow, with the first thoracic segment dark brown and marked with a whitish medio-dorsal line; the pupa is covered with short hairs most abundant at the front end and sides, and each tipped with a minute translucent globule. Length 1.25 mm.

"Two larvæ pupated March 1st, but the date of the issuing of the adults was not noted."

Mr. Schwarz, in this connection, stated that in the North American fauna there are comparatively few Coccinellidæ that feed upon the armored scales (Diaspinæ). Beside the genus *Chilocorus* and allied genera he knew only a few isolated genera of other sub-families which have this habit. These are (1) the various species of *Pseudowisea*; (2) the two species of *Cephaloscymnus*, our eastern species, which feeds upon the maple scale (*Aspidiotus furfurus*), and the western species which has been observed in Arizona preying upon an *Aspidiotus* on oak; (3) the species of *Nipus*, our smallest Coccinellidæ, representing the sub-family Cranophorinæ, which appear, however, to be too rare to have any economic importance; (4) the species of the genus *Scymnillus*.

In reply to a question by Prof. Piper, Mr. Schwarz stated that, so far as has been observed, all Coccinellids that feed upon soft-bodied scales and aphids feed also upon "red spiders" (*Tetranychus*).

—Dr. Ashmead presented the following paper :

REMARKS ON HONEY BEES.

By WILLIAM H. ASHMEAD.

Hive bees, or the genuine honey bees, are of great economic importance in all countries, not only as adding to the wealth of the people but as pollenizers of various plants and fruit trees. Their study, therefore, is always interesting, and something new may be discovered either biologically or morphologically.

A number of exotic honey bees having accumulated in the National Museum, I became greatly interested in their study and in naming the various species represented. Thinking the results of this study would prove of interest to some of our members I shall to-night give briefly some of these results, and shall exhibit most of the various species now represented in the National collection. The species exhibited are, as you will see from the labels, from various countries : Europe, Africa, the East Indies, Japan, China, Malay Archipelago, the Philippines, etc.

You are all doubtless aware that authorities differ greatly respecting the number of species of honey bees found in the world. Some think there is but a single species and treat others as mere varieties ; others that there are two or three species ; while still others would have nine, ten or a dozen species. Our material is yet too limited for me to form any decided opinion, or to settle the vexed question respecting the number of species, or the various problems connected with the numerous varieties, originating from cross-fertilization and various climatic causes ; but so far as my studies have gone I have reached almost the same opinion as that given by Mr. Frederick Smith, of the British Museum, many years ago, and published in the *Annals and Magazine of Natural History* for 1865.

The old genus *Apis* should, I think, be divided into two genera, representing the two sections first defined by Smith, as follows :

Eyes somewhat convergent above so that the vertex is narrowed, the lateral ocelli being farther from each other than to the eye margin ; second recurrent nervure received by the third cubital cell very near its apex.....*Megapis*, n. gen.

(Type : *Apis dorsata* Fabr.)

Eyes not convergent above, the vertex not narrowed, the lateral ocelli not farther from each other than to the eye margin ; second recurrent nervure received by the third cubital cell some distance from its apex.....*Apis* Linné.

(Type : *Apis mellifera* L.)

Genus MEGAPIS Ashmead.

Only two species fall in this genus.

(1.) Megapis zonata Smith.

Apis zonata Smith.

Hab.—Philippine Islands, Celebes.

This species is treated by Gerstaecker as a variety of *Apis dorsata* Fabr., but I consider it quite distinct. I exhibit a single ♀ taken by Dr. P. L. Stangl, at Bacoar, Philippine Islands.

(2.) Megapis dorsata Fabricius.

Apis dorsata Fabr.

a. var. *bicolor* Klug.

aa. var. *testacea* Smith.

Hab.—India, Java, Ceylon, Borneo, Malay Archipelago, Philippines.

Evidently a common species in some places. Dr. W. L. Abbott has sent the National Museum many specimens from the Straits Settlement.

Genus APIS Linne.**(1.) Apis mellifera Linné.**

(Typical form black.)

a. var. *ligustica* Latr.

aa. var. *fasciata* Latr.

Hab.—All parts of the world (introduced).

(2.) Apis cerana Fabricius.

Apis sinensis Smith, ♂.

Apis japonica Radoszkowsky, ♀.

Hab.—Japan and China.

I show specimens of ♀, ♂ and ♂ from Japan and China. The species is apparently common in Japan. It shows some affinity with *Apis mellifera*, but is quite distinct as may be seen by comparing the different sexes with *mellifera* exhibited together in the box.

(3.) Apis indica Fabricius.

Hab.—India.

(4.) Apis nigrocincta Smith.

Hab.—India, China, Malay Peninsula, and the Philippines.

A common species variable in the color of the abdomen.

(5.) Apis nigritarum Lepeletier.

Apis adansonii Latr.

Hab.—Africa.

A smaller species than *nigrocincta* and *indica*.

(6.) *Apis unicolor* Latreille.

Hab.—Madagascar.

It is also recorded from the Philippines, but probably erroneously.

(7.) *Apis florea* Fabricius.

Hab.—India.

This is probably the smallest honey bee known, and presents certain structural characters that will exclude it from the genus *Apis* Linné, as now restricted. In some of its characters it shows some affinities that ally it to the large honey bees *Megapis*. I propose to place it in a genus by itself under the name *Micrapis*. The lateral ocelli are farther from each other than to the eye margin, the venation nearly as in *Apis* Linné, while the basal joint of the hind tarsi in the male is incisely lobed.

Dr. Ashmead stated his belief that the honey bees were originally—in the wild state—black, unbanded, and that the yellow-banded races of *Apis mellifera* are a product of domestication and artificial selection. In discussing Dr. Ashmead's communication, Mr. Benton said he differed decidedly from the former when he stated that all wild bees belong to the black type. He cited the various races of *mellifera* which are found in eastern Mediterranean countries and have undoubtedly been wild for thousands of years, their yellow color being in no sense a result of domestication. *A. dorsata* and *A. florea* are both yellow-banded bees, yet have never been cultivated; and *indica*, which is quite highly colored in some portions of India, is cultivated to a very limited extent only. He referred to the mention of yellow bees in Virgil's 4th Georgic, and expressed the belief that the Italian race of honey bees was the result of contact between bees probably brought by early Phœnician settlers to southern Italy and the black bees of the country. He stated his belief that there have probably always been two distinct types of wild bees occupying distinct regions.

Mr. Benton said further that *Apis dorsata* has been known in literature as the Giant Bee of India; he thought it should not be called the Common Bee of India—the term applied to it by Dr. Ashmead—since that designation belongs to *Apis indica*, a more abundant and more widely distributed species than *dorsata*.

Dr. Howard asked Mr. Benton if he could tell what was the species of bee mentioned in Kipling's *Jungle Book* as chasing the "red dholes" or hairy-toed dogs of the Deccan. Mr. Benton replied that it was undoubtedly *dorsata*, a species known for its fierceness and persistence in pursuing intruders when thoroughly aroused. Dr. Howard then asked Mr. Benton whether the life-history of the honey bee as portrayed in Maeterlinck's "Life of the Bee," is scientifically accurate, to which Mr. Benton replied that it is so, except, perhaps, in some minor particulars which he did not then recollect.

—The concluding paper was by Mr. Busck, and entitled :

A NEW TINEID GENUS FROM ARIZONA.

By AUGUST BUSCK.

Dorata,* n. gen.

Labial palpi (Fig. 2) very long, porrected; second joint thickened with stiff porrected hairs, nearly smooth on the underside, roughened above; terminal joint short, deflexed, somewhat thickened with scales, pointed, though not acute. Maxillary palpi obsolete. Antennæ (♂) more than half as long as fore wings, verticillate, having a whorl of long (5) hairs at the end of each joint; basal joint with pecten. Tongue obsolete. Fore wings (Fig. 2) narrow elongate, pointed, termen very oblique. 12 veins; 7 and 8 short-stalked; 7 to costa just above apex; 1b furcate at base. Hind wings (Fig. 2) ovate, slightly broader than the fore wing; 8 veins, all separate; 6 and 7 parallel; 3, 4 and 5 equidistant. Posterior tibiæ rough-haired above.

Type: Dorata virgatella, n. sp.

This genus is not closely related to any described genus, but will, I believe, find its natural place between the *Chimabache* and the *Aplota* groups of the *Æcophoridae*. I should not be surprised if the females will be found to be wingless.

The two following species of this genus are the largest Tineids, in alar expanse, known from North America:

With fore wings striate.....*virgatella*
With fore wings plain.....*inornatella*

Dorata virgatella, n. sp.

Labial palpi dirty yellowish white. Head and thorax yellowish. Fore wings light creamy buff colored with darker longitudinal streaks of light clay color; these streaks follow the venation and are just as wide as the intervals of the ground color (Fig. 2). Cilia dirty white. Hind wings shining

*δόρατος, a lance.

straw colored. Abdomen yellowish fuscous. Legs whitish, shaded on the outside with fuscous. Alar expanse 38 mm.

Madera Canyon, Santa Rita Mts., Arizona, June (E. A. Schwarz), ♂.

Type.—No. 7782, U. S. National Museum.

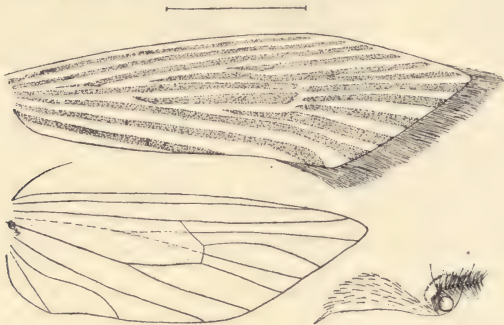


FIG. 2.—Wings and palpi of *Dorata virgatella* Busck.

Dorata inornatella, n. sp.

Labial palpi dirty white. Head and thorax light yellowish. Fore wings uniformly light yellowish gray. Hind wings shining straw colored. Abdomen yellowish fuscous. Legs whitish, shaded with fuscous. Alar expanse 36 mm.

Huachuca Mts., Arizona, August (E. J. Osler), ♂.

Type.—No. 7783, U. S. National Museum.

Mr. Schwarz called attention to the desirability of a more thorough exploration of the isolated mountain ranges in southern Arizona. From the little that is known of these regions it is safe to say that a great many species will be found there that do not occur in the corresponding zones of the plateau region of northern Arizona, where the fauna is very little different from that of other parts of the Rocky Mountains. Mr. Busck, on being questioned as to the feeding habits of this genus, replied that nothing is known concerning their habits, but that the larvæ of the genera most nearly allied to them spin webs and feed within them. Dr. Dyar said that, in his opinion, the structure of the palpi in the genus *Dorata* shows that this genus is not closely allied to the genera whose feeding habits Mr. Busck mentioned, and that, therefore, it would be unsafe to draw conclusions as to the feeding habits.

—Mr. Caudell presented for publication the following paper :

THE SYNONYMY OF *ÆDIPODA CINCTA* THOMAS.

By A. N. CAUDELL.

In 1870,* Thomas described his *Ædipoda cincta*, and a curious condition has followed, for we now have two species based on that one description—*Mestobregma cinctum* and *Trimerotropis cincta*. It is obvious that one must be changed, as two specific names cannot properly be based on one description.

Six years after making the original description Thomas referred his species with doubt to the genus *Mestobregma*,† and four years later treated of it under that genus ‡ But at that time the genera were not clearly defined and the characters used by Thomas as of generic value were inadequate for the separation of the two insects under discussion. In 1884,§ Saussure located Thomas' species, from his description, in the genus *Trimerotropis*.|| A careful study of Thomas' descriptions shows that they apply much better to a species of *Trimerotropis* than to a member of the genus *Mestobregma*. While many of the characters given apply equally well to either, certain ones apply only to *Trimerotropis*. Such are the following: Disk of the posterior lobe of the pronotum nearly flat and with the posterior angle greater than a right angle; median carina of the thorax only a raised line; posterior femora not reaching the tip of the abdomen in the female. No character mentioned in the description is inapplicable to a member of the genus *Trimerotropis*, and the type mentioned by McNeill¶ belongs to that genus. Taken all together, it seems well to consider *Trimerotropis cincta* to be the species eligibly based on Thomas' original description. This being accepted, it leaves the insect now known as *Mestobregma cinctum* to be dealt with. As a new specific name seems inevitable, I propose the name *thomasi*. The synonymy of the two species will thus stand as follows:

1. *Trimerotropis cincta* Thomas.

Ædipoda cincta Thomas.

Mestobregma cinctum Thomas (not Bruner, Scudder, etc.).

2. *Mestobregma thomasi* Caudell.

Mestobregma cinctum Bruner, Scudder, etc. (not Thomas).

* Proc. Acad. Nat. Sci., Phila., pp. 80-81, 1870.

† Bull. Ill. Mus. Nat. Hist., 1, p. 65, 1876.

‡ Rept. Ent. Ill., ix. pp. 90, 95, 113-114, 1880.

§ Prodr. *Ædip.*, pp. 171-172, 1884.

|| The insect Saussure had before him, however, was not Thomas' species, but one described some years previous by Scudder as *Trimerotropis viniculata*.

¶ Proc. U. S. Nat. Mus., xxiii, pp. 414-415, 1901.

—The following note has been presented for publication by Dr. Ashmead:

NEW GENERIC NAMES IN THE CHALCIDOIDEA.

By WILLIAM H. ASHMEAD.

Prof. T. D. A. Cockerell has called my attention to the names of several genera in my Classification of the Chalcid Flies* that are preoccupied in other departments of zoology and which must be changed. For one of these a subsequently proposed name can be resurrected; for the others, new names are here proposed:

Eufroggattia, n. n.

Froggattia Ashmead (not Horvath, 1902), Mem. Carnegie Museum, 1, No. 4, p. 238, 1904.

Eukæbelea, n. n.

Kæbelea Ashmead (not Baker, 1897), Mem. Carnegie Museum, 1, No. 4, p. 238, 1904.

Eusayia, n. n.

Sayiella Ashmead (not Dall, 1885), Mem. Carnegie Museum, 1, No. 4, p. 253, 1904.

Zaischnopsis, n. n.

Ischnopsis Ashmead (not Walsingham, 1881), Mem. Carnegie Museum, 1, No. 4, p. 289, 1904.

Prospaltella, n. n.

Prospalta Howard (not Walker, 1857), Ins. Life, VII, p. 6, 1894.

Alophomyia, n. n.

Alophus Ashmead (not Schönherr, 1826), Mem. Carnegie Museum, 1, No. 4, p. 353, 1904.

Euryophrys Förster.

Euryophrys Förster, Hym. Stud., II, p. 144, 1856.

Calypso Haliday (not Risso, 1816), Trans. Ent. Soc. Lond., p. 295, 1843.

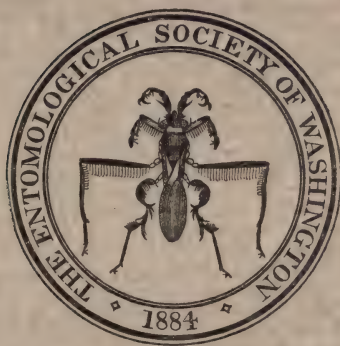
* Mem. Carnegie Museum, 1, No. 4, 1904.



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PROCEEDINGS
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VOL. VI.

JULY, 1904.

No. 3.

—The following six papers have been presented for publication:

ON THE SPECIES OF SPHENOPHORUS HITHERTO CON-
SIDERED AS SIMPLEX LECONTE.*

By F. H. CHITTENDEN.

Since the publication of *Sphenophorus simplex* by LeConte† there has been discovered, and is present in most large collections, a series of a considerably larger species which at first glance, with exception of an occasional abnormal individual, can readily be separated from the true *simplex* which was described from San Juan and Fort Yuma, California. The size of the series of *simplex* which Dr. Horn had at hand when he reviewed the genus *Sphenophorus* in 1873,‡ was less than a third of an inch. The other species which the writer has mentioned frequently measures half an inch and sometimes a little more. It is true that this second species, to which I propose to give the name of *mormon*, since it is found chiefly in Utah, is very closely related to *simplex*, as evidenced by the similarity of the sexes, and it is evident also that they had a common ancestor, or one may possibly be an offshoot of the other. During July, 1903, Mr. H. F. Wickham captured still a third form belonging to this group,

*This paper was presented for publication with No. 2 of the Proceedings but excluded for lack of space.—*Publication Committee.*

†Proc. Acad. Sci. Phila., 1859, p. 70.

‡Contributions to a Knowledge of the Curculionidæ of the United States, p. 413.

and presented the National Museum with a good series. The study of a very large series shows that although a few individuals of *simplex*, chiefly from Utah, approach in some few characters a tendency to merge into *mormon* from the same State, nevertheless they can be separated by characters which will be furnished in the accompanying table. The latter species is not known and may not occur in California, and it is much less variable than is the true *simplex*. The third species, which I have named *distichlidis*, is apparently known only from the vicinity of Amedee, California. Some of the characters, and particularly those of the sexes furnished in the description of *mormon*, have not previously been noted in this group to my knowledge. The following synopsis is furnished:

Rostrum without carinæ, or, if present, feebly indicated and short.

Scutellum variable, feebly broadly concave.

Elytra subopaque, thorax normally shining; discal striæ narrow and shallow and less distinctly punctate; sutural striæ quite or nearly straight; intervals alternately very minutely uni- and bi-seriately punctulate. Anterior tibiæ seldom serrate inside. Pygidium normally with distinct lateral apical tufts of hairs, of ♀ distinctly bilaterally concave.

simplex LeConte

Rostrum strongly carinate at middle and at sides, carinæ long.

Scutellum somewhat variable, channeled at middle.

Elytra and thorax normally shining; discal striæ very wide, deep and distinctly punctate; sutural striæ outwardly curved at base; intervals distinctly punctulate with two or three rows. Anterior tibiæ and sometimes all distinctly serrate inside. Pygidium without tufts of hair; of ♀ not bilaterally concave or feebly so.

First and second abdominal segments ♀ distinctly separate.

mormon, n. sp.

Elytra and thorax subopaque; discal striæ moderately wide, deep and punctate; sutural curved; intervals 1, 2, 3 and 5 bi- or tri-seriately punctulate. Anterior tibiæ seldom serrate inside.

First and second abdominal segments ♀ connate or subconnate.....*distichlidis*, n. sp.

Sphenophorus mormon, n. sp.

Of very similar form and appearance to *simplex*, but much larger. Surface without coating of any kind. General color polished jet black, or with the elytra piceous and the entire dorsal surface more or less polished. Legs black or dark piceous.

Rostrum three-fifths as long as the thorax, moderately arcuate, moderately nearly uniformly compressed, more narrowly at the apex, strongly

carinate on anterior margin and at the sides, the carinæ extending from the dilated portion of the base to near the apex; base moderately wide, suddenly dilated over the scrobes, feebly or not canaliculate, interocular fossa distinct, large and shallow, from which a fine impressed line leads to the median carina; anterior face of apex convex; surface nearly uniformly finely and densely punctate. Head finely sparsely punctate.

Thorax moderately convex, about one-fourth longer than wide, basal half subparallel, apical half moderately arcuately narrower to apex, which is rather strongly constricted; surface moderately deeply, finely, and somewhat sparsely punctate, punctures larger and sparse in front of scutellum, finer and dense along the basal margin. Scutellum channeled at middle.

Elytra one-fifth wider than thorax, gradually narrower toward apex; striæ punctate throughout their length, first stria strongly curved at sides of scutellum, feebly punctate at base, the others gradually more distinctly to the sides. Intervals flat, subequal in width, variable in punctuation, the first and second and sometimes the third and fourth tri-seriately punctate, the others irregularly with punctuation in one, two or three rows. Pygidium moderately coarsely and densely punctate, punctures naked or bearing minute yellow hairs, without apical tufts.

Lower surface finely, rather densely punctate, feebly on prosternum and middle of abdominal segments, sparsely in the middle of the metasternum, densely in the apical region of the last segment.

Male.—Metasternum broadly and moderately concave, first abdominal and a portion of the second segment broadly feebly concave; tibiæ angulate and strongly fimbriate with long yellow hairs on the inner surface beyond the angle, the posterior pair very strongly angulated; pygidium subtruncate with rounded sides.

Female.—Metasternum feebly concave, abdominal segments convex; posterior tibiæ not strongly angulated, less fimbriate; pygidium feebly bilaterally concave, rounded at apex.

Length 10-13 mm; width 3.6-4.5 mm.

Salt Lake City, Utah, April 19 (H. Soltau); Salt Lake, June 14 (Hubbard and Schwarz); Provo, Utah (H. F. Wickham); Reno, Nev., July, 1902 (H. F. Wickham); Laramie, Wyo., April 23, 1888 (H. Soltau); Helena, Mont., May 1 (Hubbard and Schwarz); "Dakota" (H. Ulke, 1 ex.); "Grand Coulee, Wash., Steamboat Rock, 10 July, 1902" (C. V. Piper.)

Collected in salt marshes in the vicinity of Salt Lake by Messrs. Hubbard and Schwarz.

Type.—No. 7877, U. S. National Museum. Described from abundant material.

A few obviously much worn individuals with reddish elytra have subopaque thorax and elytra, and one has reddish legs.

Sphenophorus distichlidis, n. sp.

Similar to *mormon* with which it agrees in the structure of the rostrum and, nearly, in the sculpture of the elytra. It averages a little smaller, with the entire surface subopaque, and with the legs and less frequently the elytra and thorax rufous or piceous. The punctuation is feeble, not so strong on the thorax, metasternum or abdominal segments as in *simplex*. The tibiae are less angulate and more finely fimbriate, and the anterior tibiae are normally without inside serration.

Male.—First and second abdominal segments moderately distinct; posterior tibiae more strongly angulate and fimbriate.

Female.—First and second abdominal segments connate or nearly so at the middle; posterior tibiae feebly angulate and finely and sparsely fimbriate.

Length 8.5–11.5 mm; width 3.2–4.0 mm.

Amedee, Cal., 4,200 ft., July 11–28, 1903. Collected by Mr. H. F. Wickham—who has kindly presented a good series to the National Museum—on *Distichlidis spicata*, a maritime grass which grows in salt marshes and saline spots.

Type.—No. 7878, U. S. National Museum.

Sphenophorus simplex LeConte.

In this species the normal shining jet black color is varied by individuals with more or less rufous legs, and the elytra are frequently piceous in evidently fully developed specimens. One otherwise deep black individual with velvety elytra has the base of the elytra and the legs bright rufous. In the smallest individuals there are fewer rows of punctulations in the elytral intervals than in the larger ones, and in the specimen last mentioned they are so minute as to be almost indistinguishable.

The following is added to the recorded locality list:

In California: Palm Springs, February 2, 17 (H. G. Hubbard), Los Angeles (D. W. Coquillett), Panamint Valley, April 19 (A. Koebele), Harold, March 31 (A. B. Eells), San Diego (G. H. Field). In Utah: Salt Lake City (H. Soltau), Salt Lake, June 14 (Hubbard and Schwarz).

ON THE SPECIES OF SPHENOPHORUS HITHERTO CONSIDERED AS PLACIDUS SAY.

By F. H. CHITTENDEN.

When Thomas Say in his "Descriptions of North American Curculionides," etc.,* described *Rhynchophorus placidus* with

* Complete Writings, Thomas Say, etc., Lec. Ed., 1859, 1, p. 290

the type locality "United States" he little guessed the trouble that this and other *Sphenophori* described at the same time would cause to the Coleopterist of the future. This was in 1831. When Horn, in 1873, in his Contributions to a Knowledge of the Curculionidæ of the United States* brought together under *Sphenophorus placidus* no less than seven other names as synonyms, this merely added to the trouble. By careful study of many specimens, described and undescribed, that might possibly be attributed to Say's *rectus* or *immunis*, I am unable to find any which fits either description. The characterizations of Gyllenhal and Boheman in Schoenherr's work on the Curculionidæ are equally difficult of elucidation, and from all the circumstances in the case I feel convinced that only two species of this group can rightfully retain the older names, namely, *venatus* Say and *reticulaticollis* Boheman. The latter is described from "California" which, at the time of its description, included a much larger territory than at present, and this locality and the description might very well be perpetuated for a species which I have assigned to that name. Several species have been present for years in collections under the name of *placidus*, in accordance with Horn's definition, which is, in brief, all *Sphenophori* of our fauna having a "slight fossa at the anterior median portion of the thorax immediately behind the apical constriction." The writer has been able to bring under this character seven species which cannot be placed elsewhere. All appear to be quite distinct, with the possible exception of *vestitus*, which is very different from *venatus* when we compare specimens of the former from Florida and of the latter from New England or Long Island. There is a possibility of gradation in an intermediate locality, but this has not been discovered.

Still an eighth species which has been very generally included under *placidus* has been studied, and this proves to belong to an entirely different group. It may be distinguished from any species of the *venatus* group by its naked body, much longer, perfectly cylindrical rostrum with rounded apex, longer legs, thorax more narrowed anteriorly, broader thoracic vittæ, divided apical fossa, and punctuation, which will be defined in the specific description, as well as sexual characters. It is peculiar to the Gulf region. The following brief analysis of the *venatus* group follows:

VENATUS group.

Rostrum short, strongly and uniformly compressed, moderately or strongly arcuate; apex subtruncate, produced in acute point posteriorly (sometimes abraded).

* Proc. Am. Phil. Soc., p. 426, 1873.

Thorax with distinct apical fossa not divided in the middle; more or less trivittate, vittæ half or less the length of thorax; median vitta usually Y-shaped, either enclosing the apical fossa or appearing as a tubercle behind it; lateral vittæ oblique, divergent toward base of thorax.

Vestiture alutaceous, profuse or scant.

Third joint tarsi: anterior, $\frac{1}{4} +$; middle, $\frac{1}{4}$; posterior, $\frac{1}{4} -$ wider than first joint.

A synoptic table of the seven species which belong to this group follows:

a Thoracic vittæ and apical fossa well defined.

b Rostrum moderately arcuate and compressed, distinctly canaliculate at base. Coating scant and easily abraded, not covering lower surface or sides.

c Dorsal surface strongly and coarsely punctate. Elytral surface normally without inequalities; intervals alternately strongly and less strongly elevated. Medio-basal portion of thorax coarsely, moderately confluent. Lower surface finely, sparsely punctate. N. E. to Tex..... *venatus* Say

cc Dorsal surface more coarsely punctate, usually strongly confluent. Elytral surface very unequal, interrupting striæ and intervals. Lower surface less finely punctate. Oregon. *confluens*, n. sp.

bb Rostrum shorter, more arcuate and compressed, at base coated. Thoracic vittæ narrow. Coating thin, velvety, covering most of the body. Lower surface coarsely punctate. Thorax strongly convex. Vittæ with shallow punctures, much finer than on interspaces. Fla., La... *vestitus*, n. sp.

bbb Rostrum not coated. Thoracic vittæ wide, black.

c Mostly black but with patches on base of rostrum, thorax and elytra often piceous. Thoracic vittæ broad, punctures deeper, scarcely finer on vittæ than on interspaces and elsewhere. N. M..... *neomexicanus*, n. sp.

cc Thorax variable, red, brown or black, elytra rufous or light dull brown. Thoracic vittæ still wider, finely punctate. Ariz., Cal..... *phænicicensis*, n. sp.

aa Thoracic vittæ usually feebly developed.

b Reddish, surface coating moderately dense, gray or red, thin or velvety. Scutellum shining black. Pygidium ♀ moderately narrowed to apex. First abdominal segment ♂ distinctly concave. Cal., N. M., D. C., Tex..... *reticulaticollis* Boheman

bb Black, surface coating gray or brown, thick and felt-like, covering nearly the entire body. Scutellum coated. Pygidium ♀ strongly narrowed to apex. First abdominal segment ♂ flat or scarcely concave. Tex..... *coactorum*, n. sp.

Sphenophorus venatus Say.

Rhynchophorus venatus Say, Descr. N. A. Curculionides, p. 22, 1831;

Compl. Writings, Lec. Ed., I, p. 290, 1859

Sphenophorus placidus Say, Descr. N. A. Curc., p. 23, 1831; Lec. Ed.,

p. 290, 1859; Horn, Proc. Am. Phil. Soc., XIII, p. 426, 1873;

Forbes, 16th Rept. St. Ent. Ills., f. 1887-'88 (1890), pp. 62, 65, 70;

22d Rept. St. Ent. Ills., p. 8, 1903.

Rhynchophorus rectus Say, Descr. N. A. Curc., p. 22, 1831; Compl.

Writings, Lec. Ed., I, p. 290, 1859.

Rhynchophorus immunis Say, l. c., p. 23; p. 290.

Sphenophorus confusus Gyllenhal, Schönherr, Gen. Curc., IV, p. 944,

1837 (fide Horn).

Sphenophorus fallax Boheman, l. c., VIII, No. 2, p. 256, 1845 (fide

Horn).

The distribution as well as salient characters are furnished in the table. Even with these synonyms and others eliminated it is still a very variable form.

Sphenophorus confluens, n. sp.

Form and size of *venatus*, from which and all others of this group it differs by the entire surface being more coarsely and strongly punctate, and by other characters which will be enumerated. Black, with dark brown pruinose coating evident at the sides and mostly abraded on the dorsum. Rostrum short, strongly compressed, obliquely truncate and produced in acute point posteriorly as in *vestitus*. Base very strongly and coarsely punctate, with interocular puncture in the form of a very irregular variable fossa, terminating anteriorly before or a little beyond the dilated portion above the scrobes in a broad ill-defined acuminate channel. Thoracic vittæ, owing to strong and coarse punctuation, are feebly defined, the space between foveate-punctate and strongly confluent. Elytral punctures so strong as to be subconfluent and often confluent transversely, producing with a natural uneven surface of the intervals a decided inequality of the entire surface. Sutural and third intervals with strong tendency to a double series of fine punctures most evident at the base.

Portland, Oregon (1 ♂, H. F. Wickham); Corvallis, Oregon, April 25, May 2, June 9, Oct. (A. B. Cordley); "Oregon" (H. Ulke).

Type.—No. 7908, U. S. National Museum.

The large deep punctures of the entire dorsal surface, and particularly of the elytra, produce an unevenness which impart to this insect an appearance quite different from all others in our fauna.

It is probably quite common in Oregon, although not well distributed in collections.

Sphenophorus vestitus, n. sp.

Closely related to *venatus*, more robust; surface with a dense, rather thin, more or less olive-tinted or brown alutaceous coating, which normally completely covers the entire dorsal surface except the thoracic vittæ, rostrum, head, and portions of the legs, the lower surface except the middle of the metasternum, and the first and last abdominal segments, the excepted portions being polished black. Rostrum more arcuate and compressed, with the basal dilated portion normally coated. Thorax scarcely longer than wide, punctures between vittæ frequently confluent. Lower surface moderately coarsely and densely punctate. First abdominal segment ♂ distinctly narrowly concave at middle, leaving an elevated portion each side; last segment with punctures forming a shallow fossa at apex.

Length 9-10 mm; width 3.3-4.3 mm.

Sebastian, March 7, Capron, March 22, Enterprise, May 9, 23, and Indian River, Fla. (Hubbard and Schwarz); Jacksonville, Fla., March 30 to May 23 (Wm. H. Ashmead); Gulf View and Biloxi, Miss., Oct. 9 (H. Soltau); Savannah, Ga. (Hubbard and Schwarz); New Orleans, La., March 14, Oct. 26 (H. Soltau); "La."

Type.—No. 7903, U. S. National Museum.

The Florida specimens are typical of the description furnished, as are also the specimens from Mississippi and a portion from Louisiana. Some of the remainder show a tendency toward *venatus*.

Sphenophorus neomexicanus, n. sp.

Of similar form to *venatus* but considerably smaller, black, with base of rostrum, thorax and elytra frequently reddish. Surface coating velvety gray or brown, scarcely covering half the body. Rostrum with shallow fossa at base not coated. Thorax feebly convex, subquadrate with apical fossa deep, vittæ elevated, broad and shining, a little more finely and deeply punctate than interspaces and sides which are covered with coating. Scutellum black, shining, concave or divided at middle. Elytra partially covered with coating, leaving sutural, and base of third, fourth and fifth intervals, a large humeral and subapical spot black and shining; striæ rather fine; interval punctures distinct, large, round and remotely placed (except sutural). Lower surface with sparse coating on sides; sometimes bare, abdominal segments nearly uniformly, finely and somewhat densely punctate. Ventral concavity ♂ very shallow, scarcely deeper at middle of first abdominal. Pygidial characters as in *reticulaticollis*.

Length 6.0-7.5 mm.; width 2.2-3.0 mm.

Albuquerque, N. M., Feb. 12, 16 (H. Soltau).

Type.—No. 7904, U. S. National Museum.

It will be noticed that the above described species was col-

lected in the same locality and on the same days as *reticulaticollis*, but the two species have a distinct habitus and may be easily separated, there being no intergradation in the large series examined.

Sphenophorus phœniciensis, n. sp.

Form similar to *vestitus*, smaller, ventral surface, head and rostrum shining black, antennæ and tarsi piceous; thorax variable, red, brown, or black, usually brighter on the sides of episterna; vittæ shining black; elytra rufous or dull light brown. Dorsal surface and sides covered with alutaceous coating, entirely gray or yellowish gray on sides, and pale reddish on elytra.

Rostrum half as long as thorax, moderately arcuate and compressed, surface rather strongly and finely punctate, especially at base; base strongly dilated, suddenly above scrobes, where it is acutely angled; interocular fossa pyriform; no channel; but a short impressed line extending in front of dilated portion. Apex divided anteriorly by a slightly elevated line, posteriorly strongly and acutely produced.

Thorax with constriction nearly as wide as long; apical constriction strong; posterior three-fifths of remainder subparallel or slightly arcuate; pattern of surface similar to *venatus*, apical fossa deep. Vittæ very wide, occupying fully half the disc of thorax, shining black, slightly elevated, somewhat finely and sparsely punctate, lateral confluent with median just in front of middle. Interspaces coarsely, rather sparsely and irregularly punctate, sides near lateral vittæ also sparsely but more finely punctate, on lateral margin becoming more dense. Scutellum flat, shining, declivous at base.

Elytra one-fifth wider than thorax, one-fourth longer than wide, rather strongly acuminate to apex. Striæ fine, finely and remotely punctate. Intervals unequal in width, subequal in convexity; 3 widest and most elevated, biseriately punctate; the remainder uniseriately punctate; 1 very finely, punctures closely placed; humeral and subapical callosities small and smoothly shining. Lower surface somewhat densely coated, but not more than half covered at the sides; abdominal segments nearly uniformly, finely and somewhat densely punctate, a little more finely than at the sides. Legs finely and sparsely punctate. Tibiæ sparsely and feebly fimbriate on inner surface; anterior tibiæ with outer angle slightly prolonged, others obliquely truncate, with inner angle acutely produced into a long spur; subapical spur distinct but only about one-fourth as long. Pygidium with coarse, shallow punctures, somewhat densely placed, coated with very short silvery hairs, with minute tufts each side of apex, which is moderately narrowed and rounded.

As the above description was drawn entirely from female examples, and the male, which has been recently received, is represented by a single specimen, the sexual differences may be found less striking with more material for comparison.

Male.—Lower surface more strongly punctate; especially in ventral concavity which is moderately deep, strongly sloping toward the center, especially in the metasternum; pygidium subpentagonal with rounded base.

Female.—Pygidium narrower, base less broadly rounded.

Length 7.0-7.2 mm; width 2.5-2.9 mm.

Phoenix, Ariz., and "Arizona" (1 ♂, 3 ♀♀, Colls. H. C. Fall and Chas. Palm); Fresno, Cal., May 21 (1 ♀, Hubbard and Schwarz).

Type.—No. 7905, U. S. National Museum.

Although closely resembling in a superficial manner others of the *venatus* group, this species has very pronounced characters, showing some affiliation to *neomexicanus*. From the latter it is separable by its finer punctuation alone, besides being more robust, its proportions resembling those of *vestitus*. It is not improbable that the coloration of the species may vary still more, since none of the specimens examined are true to any type; and it is also probable that the same species extends into Mexico.

Sphenophorus reticulaticollis Boheman.

Of the same form as *venatus*, a little smaller; body dull red, rostrum (except fossa at base), femora, tibiae and occiput black; surface with a soft velvety natural alutaceous coating, mostly red on the dorsal surface and gray on the sides, completely covering the dorsal surface, except portions of the thoracic vittae, the scutellum, humeral, and subapical callosities, not covering the metasternum and middle of abdomen. Punctuation of entire surface of body distinct and rather dense; on thorax, which is feebly convex, nearly uniform and but little finer on the feebly elevated and very narrow vittae; on elytra striae punctures large, interval punctures very fine and obscure, on sutural intervals minute and very closely placed. Metasternum and first abdominal segment nearly uniformly sparsely foveate-punctate, second abdominal but little coarser than third and fourth. In ♂ the ventral concavity is shallow but moderately deep in the middle of the first abdominal, and the pygidium is subquadrangular with apex rounded. In ♀ pygidium is somewhat pentagonal with minute lateral tufts.

Length 7.5-9.5 mm; width 2.8-3.6 mm.

Palm Springs, Cal., July 2 (Hubbard and Schwarz); Los Angeles Co., Cal. (D. W. Coquillett); Albuquerque, N. M., Feb. 12, 16 (H. Soltan); Del Rio, Tex., July 23, 24, 955 ft. (H. F. Wickham); Washington, D. C., August 9, 1881 (Th. Pergande).

Sphenophorus coactorum, n. sp.

Form similar to *venatus*, black, with thick pale gray or brown natural coating, felt-like and persistent, almost completely covering the surface, including the head and base of the rostrum, femora, most of the tibiae and

the entire dorsal surface, the thorax except a small black patch on the proepimera, another on the middle of the metathorax, the abdomen except those small black areas on the middle of the first and last segments and the anterior half of the second. It partially obscures the elytral punctuation but not the thoracic. Thorax nearly uniformly punctate, lateral vittæ indistinct, apex of median sometimes exposed, apical fossa more or less indistinct. Scutellum coated. Pygidium ♂ subquadrate, rounded each side of apex, of ♀ subtriangular, about one-fourth longer than wide. Metasternum very coarsely sparsely foveate-punctate, remainder of ventral surface rather coarsely sparsely punctate, very sparse on second, third and fourth abdominal. Ventral concavity ♂ very shallow, scarcely different from ♀.

Length 7.0-9.5 mm; width 2.5-3.8 mm.

Edinburg, Texas (Coll. Chittenden); Brownsville, Texas, July (H. F. Wickham); "Tex."

Type.—No. 7906, U. S. National Museum.

No other species known to the writer as inhabiting the United States is provided with such a dense felt-like covering.

NEW DIPTERA FROM INDIA AND AUSTRALIA.

By D. W. COQUILLET.

Mr. George Compere, a native of this country and for several years an inspector of fruit pests at Los Angeles, California, but at present the government entomologist of West Australia, recently transmitted to Dr. L. O. Howard, for naming, an interesting series of bred insects from that country and India, the Diptera of which were assigned to the writer for study and report. An extended search through the literature of these and the neighboring regions has failed to reveal any descriptions applicable to five of the species, and in the belief that they are as yet undescribed, they are duly characterized herewith:

Family TACHINIDÆ.

Tachina psychidivora, n. sp.

Black, the face, cheeks, palpi, scutellum, and front angles of the second and third segments of the abdomen, yellow. Vertex nearly as wide as either eye, sides of front yellowish gray pruinose, the face and cheeks white, no orbital bristles, frontals descending on sides of face half way to the vibrissæ, the latter situated distinctly above the front edge of the oral margin, ridges bristly half way to the lowest frontal bristle, cheeks more than one-fourth as wide as the eye height; antennæ three-fourths as long as the face, the third joint broad, nearly three times as long as the sec-

ond, arista thickened on the basal half, the penultimate joint slightly longer than wide; head at the lower part nearly as long as at base of antennæ, eyes bare, ocellar bristles strong, directed obliquely forward. Thorax gray pruinose and with four black vittæ, four pairs of postsutural dorsocentral bristles, three sternopleurals in a longitudinal row. Abdomen polished, the broad bases of the second, third and fourth segments gray pruinose, no discal bristles on the first three segments. Middle tibiæ bearing three bristles on the outer-anterior side near the middle, the hind ones ciliate on the outer-anterior side and with two longer bristles intermixed, pulvilli greatly elongated. Wings hyaline, third vein bearing six bristles near the base, bend of fourth vein with a distinct stump of a vein. Length 10 mm.

West Australia. A male specimen bred from a bagworm.

Family ORTALIDÆ.

Ortalis comperei, n. sp.

Head narrow, much higher than wide, whitish-yellow, center of occiput, a large spot on each cheek and a broad stripe in middle of face extending its entire length and crossing the clypeus, black, frontal vitta very narrow, yellow; front much longer than wide, narrowing towards the vertex, three pairs of frontal bristles and two rows of hairs between the two rows; antennæ one-half as long as the face, orange-yellow, the third joint slightly longer than the second, arista long-plumose; proboscis and palpi dark brown. Body short and broad, bluish green, rather thinly gray pruinose, mesonotum bearing one pair of acrostichal bristles, two dorsocentrals, one supra-alar and two humeral, scutellum bearing six bristles. Wings whitish hyaline, costa broadly bordered with a brown stripe from base to apex of the auxiliary vein where the stripe narrows and in the first basal cell terminates in a broad brown cross-band which passes over the small and posterior cross-veins; the posterior basal portion of the wing is marked with several brown spots, of which one is in the second basal cell, two in the discal, two in the anal, one large and five small ones in the third posterior, four in the axillary and one on the alula; in the apical portion of the wing beyond the brown cross-band are two more brown cross-bands, the first of which begins on the costa just before apex of the second vein and reaches a point half way across the first posterior cell, the second fills the apex of the submarginal cell and extends to the hind margin of the wing at the middle of the hind edge of the second posterior cell; small cross-vein at three-fourths of the length of the discal cell, lower outer angle of the anal cell obtuse. Legs black, the front ones except apices of their tibiæ, the middle tibiæ and their tarsi, also the hind tarsi yellowish, the last two tarsal joints brown. Length 4 mm.

Bangalore, India. Two male specimens bred from guavas by Mr. George Compere, for whom this fine species is named.

Rivellia frugalis, n. sp.

Black, the front and middle of upper part of the occiput reddish-brown, first two joints of antennæ and the tarsi yellow, apices of the tarsi brown, thorax tinged with greenish, the abdomen with bluish. Antennæ nearly as long as the face, the third joint nearly four times as long as the second, the lower anterior corner rather acute, arista bare. Thorax and scutellum thinly grayish pruinose, scutellum bearing four bristles. Abdomen not pruinose, somewhat rugose. Wings hyaline, marked with four brown, rather narrow cross-bands; the first begins at apex of auxiliary vein and extends to the fourth vein; the second extends from apex of first vein to the fifth vein, passing over the small cross vein; the third starts on the costa slightly beyond the middle of the distance between apices of the first and second veins and passes over the hind cross veins, stopping at the fifth vein; the last band begins at the costal end of the third and borders the wing to apex of the fourth vein; small cross vein near middle of the discal cell. Length 3 mm.

Colombo, Ceylon. A female specimen.

Rivellia sinuosa, n. sp.

Head reddish brown, the face and occiput except middle of upper part of the latter, black; sides of front narrowly white pruinose; antennæ yellowish, as long as the face, the third joint three times as long as the second, arista short-pubescent, proboscis and palpi dark brown. Body bluish-green, thorax and scutellum very thinly grayish pruinose, scutellum bearing four bristles; abdomen not pruinose, somewhat rugose. Legs black, tarsi yellow, their apices brown. Wings hyaline, a broad brown stripe extends along the costa from base to apex of the auxiliary vein, then narrows and in the submarginal and first basal cells ends in a wide brown cross band that extends from apex of first vein, over the small cross vein to hind margin of the wing just before apex of fifth vein where it unites with a second wide brown cross-band that extends obliquely to the costa at apex of marginal cell and continues along the costa to apex of the fourth vein; a short, broad brown cross-band extends from lower edge of the costal stripe near the base of the wing, filling the bases of the discal and third posterior cells. Length 3 mm.

Bangalore, India. A male specimen.

Family TRYPETIDÆ.**Dacus diversus, n. sp.**

Head and its appendages yellow, base of proboscis brownish, face of the male unmarked, that of the female with a transverse black fascia a short distance above the oral border, front with a central brown spot and a row of three brown dots along each eye, vertex with a narrow black fascia produced forward in the middle so as to include the lowest ocellus, occiput

with a brown vitta on either side of the center, the two connected at their upper ends by a brown fascia; antennæ slightly longer than the face, arista bare. Body black, the following markings yellow: humeral callosities, a short streak in center of mesonotum, a vitta situated a short distance above each lateral margin of the mesonotum, extending from the suture to the hind margin, a fascia extending from the front end of each of these vittæ to the upper part of the sternopleura, the prosternum largely, the scutellum, a large spot on either side of the metanotum and including the hypopleura, the hind margins of the abdominal segments, very narrow on the fourth, and the base of the ovipositor; mesonotum marked with a median pair of gray pruinose vittæ which extend from the front end to a short distance beyond the suture; abdomen devoid of black bristles and of long black hairs; ovipositor depressed, slightly longer than the fourth and fifth abdominal segments taken together. Legs of male almost wholly yellow, those of the female yellow, the apices of the femora and whole of the tibiæ black, apices of tarsi brownish. Wings hyaline, base of marginal cell brownish, costa narrowly bordered with brown from apex of auxiliary vein to a point midway between apices of the third and fourth veins, scarcely widening in its apical portion, anal cell filled with brown, which color encroaches somewhat on the third posterior cell. Length 4 to 5 mm.

Colombo, Ceylon, and Bangalore, India. Five males and three females, bred from oranges.

TWO NEW SPECIES OF CADDICE-FLIES.

By NATHAN BANKS.

The following two species of caddice-flies were collected at Wellington, British Columbia, by two local collectors, Rev. G. W. Taylor and Mr. Theo. Bryant. Both are large and striking species, one handsomely marked for a caddice-fly; the other of rather peculiar shape. One of them constitutes a new genus, *Glyphopsyche*, which includes also a species recently described as *Glyphotælius bellus*. I have named the species in honor of the collectors, who have done so much to make known the insect fauna of their region.

Halesus taylori, n. sp.

Head black, with black hair, and some yellowish hair on clypeus; palpi yellowish; antennæ black, beneath faintly, but plainly, crenulate, basal joint not as long as vertex; prothorax yellow, with long yellow hair; thorax black, lateral lobes of mesothorax and the mesoscutellum yellow, and with yellow hair. Abdomen black; legs yellow, with black spines. Anterior wings hyaline, most of the veins marked broadly with dark

brown, and the pterostigma brown; the subcosta and radius narrowly bordered with brown, the radial sector, median and cubitus more heavily margined; the mark on the median does not reach the posterior anastomosis; the region behind the anal vein is brown, the apical veins are bordered with brown on their apical two-thirds, the first and second subapicals are marked mostly on their basal portions with brown, and the third is brown to the tip; the cell behind it entirely brown. Sometimes these apical markings are heavier so as to nearly run together; however there is always a pale area across basal part of the apicals. In the hind wings the pterostigma is brown and the apex narrowly clouded. The venation is very similar to that of *Halesus hostis* except that the first and fifth apical cells do not extend basad of the anastomosis. Expanse 35 mm.

Several specimens from Wellington, British Columbia (Taylor and Bryant).

Glyphopsyche, n. gen.

Spurs 1, 3, 4. Apical margin of forewings distinctly and evenly excavate; pterostigma elliptical, almost closed at base by the sudden up-bending of the vein; discal cell very long; membrane of wings finely rugulose, more distinct at pterostigma; basal joints of antennæ almost as long as vertex.

This genus has much resemblance to *Glyphotælius*, but differs in more prominent pterostigma, in the much smaller prothorax, and different shape of head.

Type.—*G. bryanti*.

Glyphotælius bellus Banks, recently described, also falls in this genus. It differs from the type not only in color, but in having the 1st apical cell extending a little on discal cell, and the 5th apical not acute at base, although narrowed.

Glyphopsyche bryanti, n. sp.

Head black, with some short white hair, particularly prominent near margin of eyes; palpi black; antennæ yellowish brown; prothorax yellowish above, with white hair, and black hair on the sides; mesothorax dark brown, with a broad grayish-white stripe in the middle, less distinct on metathorax. Abdomen dark brown; legs dull yellowish, with black spines, the tips of tibiæ and tarsal joints narrowly brown. Wings brown, darker beyond anastomosis; the costal area (and sometimes elsewhere) shows many pale irregular spots; before middle of wings there is an oblique white space between median and cubital veins. In the base of the third apical there is a very distinct circular white spot. At the margin there is a narrow white spot in the middle of each apical cell; those in the subapicals I and II are broader and nearly touch, that in the third subapical is very small; behind the anal veins are a few pale spots and streaks. The first apical does not extend back on the discal cell, and the fifth is

acute or even short pedicellate at base. In the hind wings the apical part is faintly fumose, and the pterostigma a little darker.

Expanse 38 mm.

Two specimens from Wellington, British Columbia (Theo. Bryant).

TWO NEW FORMS OF *ÆNEIS* Huebner.

By HARRISON G. DYAR.

Mr. Merritt Cary collected a number of specimens of *Æneis* (*Chionobas*) in British America in 1903, and among them are two forms that do not agree with any known to me.

Æneis caryi, n. var.

Gray brown above, washed with dark ferruginous red submarginally on fore wings, over most of surface of hind wings; two large black ocelli on fore wings above veins 2 and 5, respectively, one on the hind wings near anal angle, the three minutely white pupilled and repeated below. Fore wings below reddish on the disk and inner margin; hind wings contrastingly marbled in black and white, the median band strongly white edged.

One ♂, Smith Landing, Athabasca, June 13, 1903.

Type.—No. 8046, U. S. National Museum.

Near *norna* Thunberg, but the red color of the wings is much darker and more rust colored than in this form or in *katahdin* Newcomb.

Æneis nahanni, n. sp.

Blackish above, washed with ferruginous brown, the veins darker, the markings of underside showing. A small ocellus or none above vein 5 on fore wings, two to five on hind wings, the one above vein 5 largest, the rest small or absent. Hind wings below black and white, coarsely strigose, somewhat as in *uhleri* Reakirt and *varuna* Edwards, but much more densely, the white of the wing being largely obscured. Median band weakly indicated; ocelli black with white pupils; fore wings shaded with red over the disk.

One ♂, one ♀, Nahanni Mts., Mackenzie, 2,500 feet, July 16, 1903.

Type.—No. 8047, U. S. National Museum.

Differs entirely in color from *uhleri*, and in the coarseness of the markings below from the forms of *norna*.

DIVERSE MOSQUITO LARVÆ THAT PRODUCE SIMILAR ADULTS.

By HARRISON G. DYAR and FREDERICK KNAB.

In going over somewhat carefully the material in Culicid larvæ that has been gathered by Dr. Howard to be figured, the writers have met in more than one instance with diverse larvæ that produced adults so similar that they have not been differentiated with the material now at hand. As examples we cite:

Culex cantans Meigen.

1. What we have considered as the normal form has the air tube about three-and-a-half times as long as wide, the pecten consisting of two rows of teeth with the distal two or three detached. The tracheal tubes are broad, band-shaped, slightly waved segmentarily, broadened within the air tube. The long abdominal hairs on segments 3 to 6 are single; the hairs on the head are in tufts of two or three centrally, five in the tuft next the antennæ.

2. The second form has the air tube about four times as long as wide, the pecten of evenly spaced teeth without any detached. The tracheal tubes are very narrow, uniform, strongly bent segmentarily, especially in abdominal segment 7, where they form acute angles, likewise narrow within the air tube. The long abdominal hairs on segments 3 to 6 are double; the hairs on the head have three to four hairs in the central tufts, about nine in the tuft next the antennæ.

Both forms have been taken at Springfield, Mass., by Dr. Geo. Dimmock and Mr. F. Knab, in temporary pools in fields and woods formed by the melting of the snow in the spring.

There must be two species here in spite of the apparent similarity of the adults.

Culex restuans Theobald.

1. The usual form has the air tube about three-and-a-half times as long as wide, slightly fusiform, strongly tapering to the tip, furnished with about six scattered hairs, coarse, single, only the one nearest the tip sometimes in the form of a small tuft. The anal processes may be much elongated.

2. The other form has the tube about four times as long as wide, slender, not fusiform, gradually tapering, the only hair a small tuft beyond the outer third. Otherwise, as in the usual form, the antennæ and the peculiarly shaped labial plate being the same.

Both forms have been taken at Cummington, Mass., by Mr. F. Knab, in a "pothole" in a rock, about six feet above the level of the Westfield river, in company with *C. atropalpus* Coq.

The usual form we have from many other places, such as St. Anthony Park, Minn. (F. L. Washburn) ; Center Harbor, N. H. (H. G. Dyar) ; Durham, N. H. (H. G. Dyar) ; Ithaca, N. Y. (O. A. Johannsen) ; Saranac Inn, N. Y. (O. A. Johannsen) ; Lahaway, N. J. (J. T. Brakeley) ; Baltimore, Md. (Dyar and Caudell) ; Washington, D. C. (H. G. Dyar) ; St Asaph, Va. (F. C. Pratt), in temporary pools, roadside puddles, water barrels, etc. The second form has been mentioned by Dr. John B. Smith,* as collected by him at Lahaway, N. J., and he considers it specifically distinct from *restuans*. The differential character which he mentions between the labial plates of the two forms is, however, not existant in our specimens.

These forms are, we think, not specifically distinct, as we have some specimens that indicate an intergradation of the characters.

Culex impiger Kirby.

1. The usual form has the air tube about two-and-a-half times as long as wide, thick, tapered outwardly, the pecten followed by a single tuft. Anal segment with slight tufts before the barred area. The lateral comb of the 8th abdominal segment consists of a large patch of small spines over three rows deep. On the head the upper frontal tuft consists of six hairs, the lower of three, the one near the antennæ of seven.

2. The other form has the air tube of the same proportions, but the pecten has three or four large detached teeth which extend well beyond the tuft, almost to the apex of the tube. There are besides on the ventral aspect, two small tufts and two rows of long tufts on the dorsal side. The anal segment has ventral tufts almost to the base. The lateral comb of the 8th abdominal segment consists of a small patch of large, thorn-shaped spines in an irregular double row. The head hairs have three in the upper frontal tuft, one in the lower, seven in the tuft near the antennæ.

The first form we have abundantly from Kaslo, B. C.,† the second form from Kaslo also, and from Springfield, Mass., where it was collected by Dr. Geo. Dimmock, under the number 2173. At present the adults have not been separated; but in this case we hope that they may yet prove to be distinguishable, for our bred series of the second form is very small and not well preserved. Better material may show differences. The larvæ are certainly abundantly distinct.

* Ent News, XIII, p. 303, 1902.

† Dyar, Proc. Ent. Soc. Wash., VI, p. 37, 1904.

APRIL 7, 1904.

The 186th regular meeting was held at the Sængerbund Hall, 314 C street, N. W., Vice-President Banks in the chair, and Messrs. Ashmead, Barber, Benton, Busck, Caudell, Currie, Dyar, Gill, Heidemann, Kotinsky, Morris, Patten, Schwarz and Ulke, members, and Mr. Frederick Knab, visitor, present.

Mr. Schwarz exhibited some fruit of the wild fig tree found at Cayamas, Cuba, and specimens of the insects found in them. At Cayamas only four trees of *Ficus* were found in the timber—all of them of very tall growth, the lowest branches being from 40 to 50 feet above ground, so that no close observation could be made. In the middle of February bird droppings on the leaves of various low shrubbery were noticed to be composed of seeds of figs intermingled with minute insect remains. About the same time scattered specimens of the hymenopterous genus *Idarnes*—a well-known parasite of *Blastophaga*—could be found flying about in the woods. Finally, from one of these trees the dropping of ripe figs commenced at the rate of about four in one minute and many thousands of figs dropped from this one tree in the course of a few days. An investigation of these fallen figs showed that they were male figs, *i. e.*, every one of the seeds was a gall flower inhabited by the true caprificators (*Blastophaga*) or by parasites belonging to the genus *Idarnes*. Not a single specimen of a female *Blastophaga* was found in the falling figs, but only males, averaging in number from seven to twenty in one fig. Both ♂ and ♀ specimens of the parasitic *Idarnes* abounded in the figs. These parasites issue from a single hole in the side of the fig, but it appears that they can issue only at a certain period in the ripening of the fruit, for many figs were found in which the *Idarnes* had been unable to escape and had died. Mr. Schwarz has come to the conclusion that the particular tree from which the figs were dropping was a caprifig tree, *i. e.*, a male tree, and, to all appearance, of the same character as the caprifig tree in the Smyrna figs. The other trees, from which not a single fig was falling, were, it may be inferred, either female

trees or trees whose flowers are adapted to carrying on the subsequent generations of the fig insects.

Dr. Ashmead asked Mr. Schwarz if these Cuban figs belonged to one of the species found in Florida. Mr. Schwarz replied that he did not know. Dr. Ashmead stated that there are three kinds of wild *Ficus* in Florida. Mr. Schwarz asked Dr. Ashmead whether the species of *Blastophaga* could be determined from male specimens. Dr. Ashmead replied that they could.

—Mr. Barber exhibited some hymenopterous cocoons which he had found at Williams, Arizona, in 1901. He said that the cocoons were beaten from oak shrubs and were observed to be capable of making jumping movements. Their jumping capacity amounted to about one-fourth of an inch. After consulting the literature Mr. Barber found that they belong to the genus *Limneria* and that at an early period, viz., by Geoffroy at the beginning of the last century, the jumping habits of the cocoon had been observed. Dr. Ashmead then said that *Limneria* belonged to the Ichneumonid tribe Campoplegini, containing some sixty-five genera, all members of which have cocoons of this kind.

—Mr. Benton stated that the Japanese had just translated into their own language the bulletin on the honey bee published by the U. S. Department of Agriculture.* A copy of the translation was passed around for inspection.

—Dr. Ashmead reported that a collection of nearly 200 species of Japanese parasitic Hymenoptera had recently been received by the U. S. National Museum from Dr. S. Matsumura, Agricultural College, Sapporo, Japan. The collection contains many interesting forms.†

—Mr. Banks exhibited a specimen of the Neuropteran *Mantispa viridis*. This species was described by Walker from eastern Florida, and Hagen, who had never seen it, thought that, owing to its green color—foreign to other known Mantispidae—it must have been a manufactured insect. But the receipt by Mr. Banks of a specimen from Florida, collected by Mrs. A. T.

*Bull. No. 1 (N. S.), Div. Ent., U. S. Dept. Agric. The Honey Bee: A Manual of Instruction in Apiculture. By Frank Benton, M. S. Washington, 1896.

†See Descriptions of New Hymenoptera from Japan.—I. By William H. Ashmead. Journ. N. Y. Ent. Soc., xii, No. 2, pp. 65-84, June, 1904.

Slosson, and of one from Nicaragua, collected by Prof. C. F. Baker, shows that the species exists in nature.

—Mr. Banks mentioned having a specimen of the stonefly *Acroneuria ruralis* (Hagen) in which one fore leg is but one-third its proper size, indicating that this leg had probably been lost and then replaced. This, he said, would furnish the first record in the Perlidæ of regeneration of appendages. He stated that in spiders of the family Thomisidæ it was very common to find specimens in which one of the legs was of reduced size. He has in his collection, also, a spider of the family Attidæ, *Dendryphantès bifida* Banks, in which one front leg is much reduced in size and lacks the spiny armature. This is the first record of the kind in the family Attidæ.

—Mr. Schwarz said that during his stay at Cayamas, Cuba, he came across a gigantic net of the social spider *Uloborus republicanus* Simon (as determined by Mr. Banks). From the excellent paper by Mr. E. Simon* it was to be seen that socialism in Arachnida is of very rare occurrence, and that no case has hitherto been reported from the West Indies, *Uloborus republicanus* having been described and previously known only from Venezuela. Mr. Schwarz said that he was not prepared to see a net of such gigantic proportions. It occupied nearly the whole crown of a felled tree. Its width, naturally irregular in outline, was from seven to nine feet, its height from five to seven feet, while its depth averaged three feet. The whole structure exactly resembled the figure given by Mr. Simon. The male spiders, easily distinguished by their brown color from the females, occupied one of the lowermost corners of the net. An attempt was made to count the individual spiders or spider webs, but after 200 specimens were counted the attempt was abandoned. Mr. Schwarz estimated that upward of 1,000 specimens were the occupants of this structure. The whole net formed a most perfect trap for all insects that flew through the clearing made by the felled tree, and the individual webs of the spiders were found to be full of insects of all kinds, but more especially of various Diptera which are common in Cuba during the winter months, viz., one or two

*Voyage de M. E. Simon au Venezuela (Decembre 1887-Avril 1888) 11e Mémoire (1). Observations Biologiques sur les Arachnides. By Eugène Simon. Ann. Soc. Ent. France, LX, pp. 5-14. pls. 1-4, 1901.

species of *Hippelates* and a species of *Hormomyia*—all of them very troublesome pests to man. Mr. Schwarz said that he had nothing to add to Mr. Simon's excellent account, and he wished to testify as to the correctness of the latter's illustration of the net. Three other nets of the same social spider were found near by, but these were of greatly inferior size, the largest of them being occupied by about 300 spiders.

In discussion of this note Mr. Banks reviewed the literature of the social spiders as given in Mr. Simon's article. He stated that the nearest approach to a social spider in the United States is *Theridium studiosum* Hentz, which is very closely related to *T. socialis* Simon. In this country one frequently finds several webs of *Hyptiotes*, the nearest genus to *Uloborus*, on the same dried branch, but not connected. Dr. Gill asked whether there is a discrepancy in size between the two sexes of *Uloborus*, and mentioned a Madagascar spider, *Nephila madagascarensis* Vinson, in which the female is more than 100 times as large as the male. Mr. Banks replied that in our *Nephila plumipes* Koch the male is just as small in proportion as in the Madagascar species. Mr. Schwarz said that the male of *Nephila plumipes* is just as common as the female, but that it is easily overlooked from its small size and from the fact that it always occurs opposite the large body of the female on the other side of the web. It appeared to him that on account of its extremely small size and from the fact, just mentioned, that it is always on the other side of the web, that it is well protected from the cannibalistic habits of the female *Nephila*. Dr. Ashmead mentioned the genus *Gasteracantha* as an instance among spiders in which the male is smaller than the female. Mr. Banks remarked, however, that the disparity in size in that genus is not nearly so great as in *Nephila*. Mr. Caudell stated that it is not uncommon to find numbers of spiders huddled together in one place in winter. Mr. Banks said that he did not consider this an example of socialism; the spiders simply happened to seek the same place for hibernation.

—Mr. Banks presented the following paper:

NOTES ON THE STRUCTURE OF THE THORAX AND
MAXILLÆ IN INSECTS.

By NATHAN BANKS.

(PLATE I.)

When one looks at the complicated structure of the thorax in a fly or a bee, it seems almost impossible to tell much of the origin of the parts. But it is not so difficult to unravel the tangle if we start at the right end. Several years ago while looking at some Chilopods one point in the solution occurred to me. I published upon it at that time, and since then have often been confirmed in the view then expressed that the segments of the thorax are compound. It is generally admitted to day (more so than ten years ago) that the Chilopods are closely related to the ancestors of the winged insects; and no one, I think, can study them without arriving at that conclusion.

If we look at one of the lower and simpler Chilopods, as a *Geophilus* or *Mecistocephalus* (Plate I, fig. 8), we will notice that the head is followed by a series of segments, subequal in size, each bearing a pair of legs, and (except the first) spiracles. If one examines a more compact Chilopod, as *Scolopocryptops*, two kinds of segments are seen, the larger with spiracles, the smaller without them. In *Lithobius* (Plate I, fig. 1) this process has gone further, the small segments are smaller, the large are larger, and overlap or even cover the small ones. In *Cermatia* the dorsal scutæ of the small segments have coalesced with the large segments. This, I believe, has happened to all insects; what we consider a segment of the thorax being really two segments united. There are various external points of proof. One that I previously advanced is that in *Machilis* there are jointed appendages to the abdomen which appear to represent legs. Similar appendages are attached to the middle and hind coxæ; these, then, may represent the legs to the other segments of the thorax. Three years ago Mr. Walton called attention to the structure of the coxa, showing that there are present the basal parts of two appendages; the trochantin and epimeron representing basal joints of a leg now no further developed. He reasoned from this that the thorax was compound. He did not then know of my article. I have given (Plate I, fig. 7) a side view of the coxa of a *Panorpa* where one can see that the coxa shows these two sets of basal joints. This appearance is readily noted in most Neuroptera (very clearly so in Psocidæ), and can be made out by a little study on many of the higher insects.

In my note of ten years ago I stated that I thought the prothorax might not be compound, but now I consider that it is

formed of two segments as are the meso- and metathorax. One will see that this is probable by a glance at the figure of a *Lithobius* (Plate I, fig. 1). Many insects show a transverse groove on the pronotum. It is seen that the spiracles of the small segments have disappeared in *Lithobius*. This has a direct bearing on the question, if it be true (as the best evidence seems to show) that the wings of insects originate from rudimentary spiracles. Since there are not in the lowest Chilopod any spiracles on the first segment, this will explain why there have been no prothoracic wings in insects. If we look again at a *Lithobius* (Plate I, fig. 1) we notice that behind the thorax is a segment not followed by a smaller one. This will become the median segment of insects, in some forms united to the thorax.

Are the abdominal segments of insects compound? I do not know of positive evidence, but in looking at *Lithobius* one would think that the abdominal segments were also compound. In many insects there are indications of transverse division on some of the abdominal segments. Still one cannot argue too literally from *Lithobius*, for *Lithobius* is not the ancestor of insects but only closely related thereto.

If we compare the head end of the lower and higher Chilopods we notice that there has been an increase in the size of the poison-claw, and a more or less definite coalescence with the head. It would seem, therefore, that in insects a more complete coalescence has been accomplished. And it is so. The Chilopod (Plate I, figs. 1, 5, 6, 8) has a pair of mandibles; a lip with jointed lobes each side; a pair of slender jointed appendages, sometimes called maxillæ; and the poison-claws overlapping all. What has become of these parts in insects? If we examine the larva of a Perlid (Plate I, figs. 2, 4), we see mandibles, lip with lobes or palpus, and a complicated maxilla. In side view, this looks much like the poison-claw, and it is. In some Perlid larvæ, one can, with a little care, separate the maxilla into two separate and independent structures, without rupturing the teguments. The inner part is the palpus, with its own basal joints, normally concealed by the stipes and cardo. The outer and larger part is the old poison-claw, now galea and lacinia. In most insects the pressure of the former poison-claw against the palpus has resulted in a coalescence and twisting of parts. However, in many insects (Carabidæ, etc.), the galea is divided into two segments, thus showing that it represents an appendage as well as the palpus. The lacinia, I should guess, is developed from a spur at the base of a joint. A similar articulated piece is found in the mandibles of some beetles (as Cetonidæ). Thus I believe that the maxillæ of insects represent two pairs of appendages fused together at base; and that each segment of the insect thorax is composed of two primitive segments.

I shall not now go into the rise of the clypeus and labrum, only to note that in the Chilopod there is a piece bent down between the large and approximate antennæ, which, as the antennæ separate, will become more prominent, and as the mouth moves forward will become dorsal in position.

Regarding the history of the compound thorax theory, it may be well to record that Hagen in 1889 said he thought each segment was composed of three, one each for the legs, the spiracles, and the wings; but his views are not at all in line with mine, and were unknown to me in 1893 when I broached my theory. In 1900 Mr. Walton, upon studying the coxa, concluded that the thorax was composed of six segments. He was then unaware of the papers by Hagen and myself. Kolbe in his "Einführung" gives practically the same version of the segmentation of the thorax that I have given. Kolbe's work was finished late in 1893, but was issued in parts, and the part dealing with this matter must have appeared about 1891, although unknown to me in 1893.

Since I have written this paper (which was on the program for presentation last fall) I have seen a paper by Verhoeff (published in May, 1903), in which he accepts the compound nature of the thorax and gives names to the parts, as follows:

between head and prothorax—Microthorax;

between pro- and mesothorax—Stenothorax;

between meso- and metathorax—Cryptothorax.

He shows that in *Japyx* the cryptothorax still retains the spiracle, and he finds traces of these segments in various insects.

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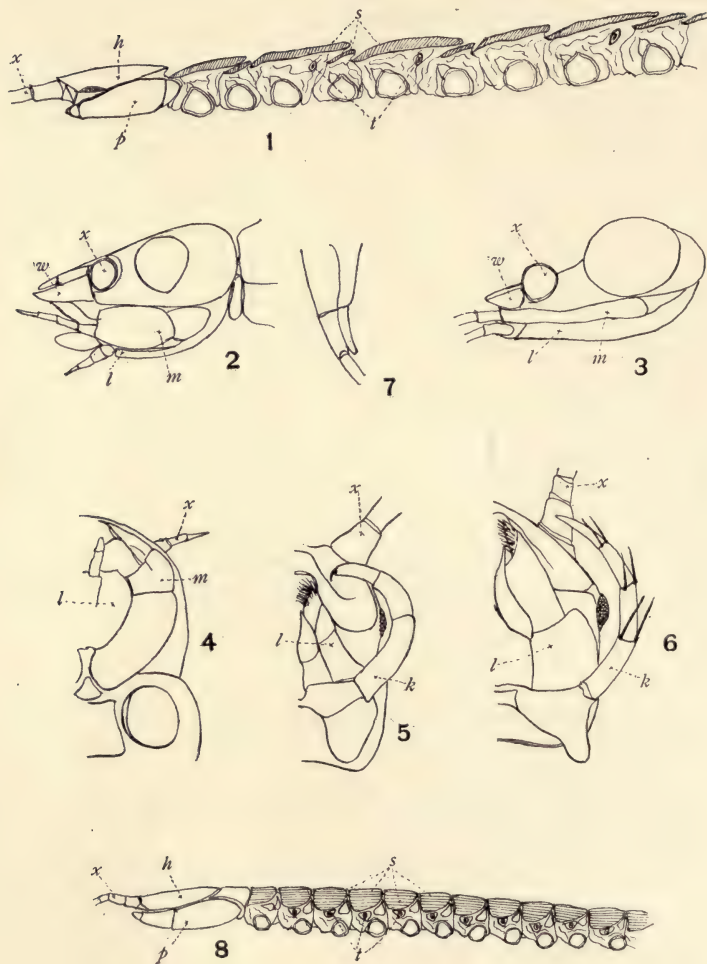


PLATE I.

EXPLANATION OF PLATE I.

1. *Lithobius*, anterior part of body.
2. Head of larva of Perlid.
3. Head of adult *Perla*.
4. Mouth parts of Perlid larva.
5. Mouth parts of *Lithobius*.
6. Mouth parts of *Cermatia*.
7. Coxa of *Panorpa*.
8. *Mecistocephalus*, anterior part of body.

Legend:

h, head; *l*, lip; *m*, maxillæ; *k*, leg I, which becomes part of maxilla; *p*, poison-claw; *s*, dorsal scutæ; *t*, spiracles; *w*, mandible; *x*, antenna.

Dr. Gill asked Mr. Banks whether his views as to the mouth parts of insects corresponded with those of Prof. John B. Smith. Mr. Banks replied that he did not believe that Prof. Smith's investigations had been carried on along the same line as his own. He did not believe that Prof. Smith suspected that the maxilla was a compound organ.

The subject of Myriapoda and their relation to insects and other Arthropods was discussed by Messrs. Morris, Gill, Banks and Ashmead. Dr. Gill said he thought Mr. Banks' theories as set forth in his paper just read were plausible, although, of course, it remained to be seen whether further investigation would bear them out.

—Mr. Schwarz exhibited and described a structure made by a Psyllid larva on the leaves or young shoots of *Piscidia erythrina*, the fish-killing plant of the West Indies, at Key West, Florida, and at Cayamas, Cuba. He stated that among the numerous species of North American Psyllidæ there are comparatively few that are gall-makers, or that cause deformations in the various parts of the plant they affect. Only two nest-making or nest-spinning Psyllidæ have hitherto been known, and these only from Australia, *i. e.*, the genera *Spondyliaspis* and *Cardiaspis*, as explained by him in a paper read before the Society some time ago.* The species from Key West forms a

*Proc. Ent. Soc. Wash., IV, No. 2, pp. 66-73, March 21, 1898.

nest-like, globular structure of whitish color, usually along the mid-ribs of the fully developed leaves (fig. 3). Upon examination the wall of this structure is seen to be composed of fine, cotton-like threads. When inhabited by the larvæ the nests are of a sticky nature, but old specimens become brittle in time. They are fastened to the leaves by a broad base so that the larva, in feeding, is forced to push its beak through this space into the parenchyma of the leaf. A large number of the adult Psyllids were bred from the specimens from Key West, but unfortunately none of them were in perfect condition, so that the systematic position of the Psyllid, viz., whether it belongs to the Aphalarinæ or the Psyllinæ, remains in doubt. Mr. Schwarz stated that from the character of the larvæ it would appear that the species belongs to the



FIG. 3.—Nest-making Psyllid from Key West, Florida.

Psyllinæ rather than to the Aphalarinæ, the wing parts in the former subfamily being more oval and more towards the sides of the body; whereas in the Aphalarinæ the wing parts are of a more quadrangular shape and more towards the dorsal portion of the body. In this connection Mr. Schwarz reviewed the larval habits of such American Psyllidæ as have hitherto been studied biologically.

In discussion Mr. Busck stated that he, also, saw this Psyllid at Key West, Florida. Dr. Ashmead said that since Mr. Schwarz's paper on the nest-making Australian Psyllidæ the subject has been taken up by Mr. Froggatt in Australia. Other species of the genera *Spondyliaspis* and *Cardiaspis* have been described by the latter author, but no progress has been made in our knowledge of the peculiar structures made by their larvæ.

MAY 5, 1904.

The 187th regular meeting was held at the Sængerbund Hall, 314 C street, N.W., Vice-President Hopkins in the chair, and Messrs. Ashmead, Benton, Currie, Dyar, Gill, Heidemann, Kotinsky and Ulke, members, and Mr. Frederick Knab, visitor, present. The Corresponding Secretary presented a report. Among other publications he reported the receipt from Baron C. R. Osten Sacken of the latter's autobiography entitled "Record of My Life Work in Entomology."* A copy of the work was shown. Mr. Ulke stated that he became acquainted with Baron Osten Sacken in 1856, the latter having come to Washington at that time. He gave some personal reminiscences of the Baron.

—Mr. S. Arthur Johnson, First Assistant in Zoology in the State Agricultural College, Fort Collins, Colorado, and Mr. Frederick Knab, temporarily residing at 729 Thirteenth street N.W., were elected to corresponding membership.

—Dr. Dyar showed a copy of Rothschild and Jordan's "A Revision of the Lepidopterous family Sphingidæ,"† and stated how their changes in the generic names had been arrived at. Their method of determining the types of composite genera differs from that usually employed in the three following particulars: (1) No generic name is to be recognized unaccompanied by some sort of printed description; (2) the first species of a composite genus is to be regarded as the type; (3) a subsequent genus containing the type of a preceding one is a synonym thereof, whether its first species be the same or not.

Under (1) Hübner's Tentamen names and all catalogue names are rejected, even though accompanied by the plain designation of a species as the type, while every name is accepted that has some sort of description attached, even if that description contains not a single character that will define the genus. Dr. Dyar said he thought that the line had been drawn arbitrarily by these authors. A name accompanied only by some well-known species as type is often more intelligible and useful than another with a long description which gives no essential characters.

*Cambridge, Mass., October, 1903.

†Novitates Zoologicæ, ix, Suppl., 1903.

(2) The taking of the first species of a genus as the type is defended as an extension of the rule of priority. It is also defended as the shortest and least laborious method and the one most likely to produce uniformity. Dr. Dyar agreed with the authors that it was certainly easy and a most gratifying relief from the labors incidental to any attempts to arrive at the types of genera by the method of elimination. This method had, he said, been rather a dismal failure, so far as applied to insects. No two authors seem capable of arriving at the same results in a particular case. He was inclined to attribute this to faulty research, and he supposed that when all the literature had been examined a finality would be arrived at. However, if general consent were to be obtained he admitted that this new method would save an immense amount of irksome labor. The principal objection to it seems to be that it has not been generally adopted in other branches of zoology. A uniform method of determining types of genera should obtain throughout the animal kingdom. Therefore, until a change shall have been effected in the rules of nomenclature the generally accepted method of elimination should be continued. Dr. Dyar said that it might be further urged that the method did not do justice to the writings of subsequent authors, and the student would be inclined to omit studying them.

As to (3) Dr. Dyar failed to see why it was propounded. It does away with some names which have, strictly, little right to be recognized, yet which might be retained if rule (2) were allowed to cover those cases as well. Two genera containing exactly the same species might then be preserved if their first species was different. Dr. Dyar could not see any harm in this, and he believed that the less rules there were in force the better it would be for simplicity.

Dr. Gill said that as applied to the Linnæan genera the method of taking the first species as type was unsound. Linnæus placed his species in a graded sequence, those connecting one group with another being placed at the beginning and the end. The really typical forms would be found in the middle of the genus and the first species often contradicts the diagnosis in one or even several particulars, as is the case with *Squalus pristis*.

Dr. Dyar said that the method of elimination was calculated

to produce no better results. The frequent outcome of its application was to determine as the type the most obscure and least known species of the genus. Thus, in Hübner's genera in the "Verzeichniss" not only are the well-known European forms included but they are followed by those known to Hübner only by Cramer's figures and which fall in these genera owing to Hübner's definitions being based on pattern of markings and coloration. It is perfectly natural that subsequent authors remove first those well-known European species, leaving the type of Hübner's term to fall upon some South American form usually belonging to another family and which was autoptically unknown to Hübner. In this case the method of taking the first species as type produces better results and is more just to the author.

Dr. Ashmead pointed out that the action of previous authors should be taken into account and their determinations of types, when justified by the rules, should be binding and ought not to be changed. This not only in justice to the authors but in obedience to the rule of priority.

—Dr. Ashmead stated that he had received another consignment of Philippine Hymenoptera from Father W. A. Stanton of the Philippine Weather Bureau, Manila, P. I. The collection contained about thirty-one new species—additions to his recently published list of Philippine Hymenoptera and, to a large extent, representing families not before known from the Philippines.

—Dr. Hopkins informed the Society that he had just received a letter from Mr. Burke, now in Washington State investigating forest insects, in which the latter stated that he had succeeded, by fastening little cages to the trees, in capturing emerging adults of the Syrphid fly whose larva, as ascertained by him last summer, is destructive to the Western hemlock. The larva lives in, or under, the bark, entering by a wound made by a woodpecker or Scolytid beetle and, enlarging it, causes an accumulation of pitch and makes a bad defect in the wood. Dr. Ashmead recalled that in Florida he had found certain Syrphid larvæ living in the bark of pine.

—Dr. Hopkins mentioned that on his recent trip into the southern States, he had observed that certain Scolytid beetles whose range extends from the West Indies north into the United States are smaller as one goes southward, showing, in his opinion, that they were originally northern species.

—Dr. Dyar presented the following paper :

NOTES ON SYNONYMY AND LARVÆ OF PYRALIDÆ.

By HARRISON G. DYAR.

Euzophera gigantella Ragonot:*Euzophera gigantella* Ragonot, Nouv. gen. Phyc. and Gall., p. 32, 1888.*Euzophera gigantella* Ragonot, Rom. Mem., VIII, p. 51, 1901.*Honora cinerella* Hulst, Journ. N. Y. Ent. Soc., VIII, p. 223, 1901.*Honora cinerella* Hulst, Bull. 52, U. S. Nat. Mus., p. 433, 1902.

Hulst's ♀ type is before me. It has not the contrasts of black shades shown in Ragonot's figure,* but these shades are barely mentioned in the text and not at all in the original description, so it appears that the figure is either over colored or made from an unusually dark specimen. The species belongs to *Euzophera* rather than to *Honora* as the cell of the hind wings is long, being nearly half the length of the wing.

Vitula serratilineella Ragonot.*Vitula serratilineella* Ragonot, Diag. N. A. Phycit. and Gall., p. 15, 1887.*Vitula serratilineella* Hulst, Trans. Am. Ent. Soc., XVII, p. 179, 1890.*Eccopisa serratilineella* Ragonot, Rom. Mem., VIII, pp. 33, 560, 1901; Pl. XLIX, fig. 23.*Vitula serratilineella* Hampson, Rom. Mem., VIII, p. 83, 1901.*Eccopisa serratilineella* Hulst, Bull. 52, U. S. Nat. Mus., p. 430, 1902.*Vitula serratilineella* Dyar, Proc. Ent. Soc. Wash., v. p. 104, 1903.Not *Vitula serratilineella* Hampson, Rom. Mem., VIII, Pl. XLII, fig. 12, 1901.

The species belongs to *Vitula* as originally placed by Ragonot, since the ♂ has none of the peculiar characters described for *Eccopisa* Zeller. Hampson places it positively in this genus,† but without good reason, for he had no ♂, as the citations in the text show. The figure (Pl. XLIX, fig. 23) is a fair representation of the species, but the second figure (Pl. XLII, fig. 12) is quite a different insect, apparently belonging to another genus, and a male, if the drawing is to be trusted. The generic term *Eccopisa* is due to a misreading of Dr. Hulst's manuscript or to a clerical error of his; he evidently intended to write *Eccopisa* Zeller. I had to supply the authors' names and the references and, not finding *Eccopisa*, thought it one of the new names being proposed by Ragonot in Vol. VIII of the Romanoff Memoirs, not then available. The term *Eccopisa* (Ragonot) Hulst will be cited as

* Rom. Mem., VIII, Pl. xxv, fig. 25.

† Rom. Mem., VIII, p. 560, 1901.

a synonym of *Vitula*, type *serratilineella* Ragonot. There is no known American species of *Eccopisa* Zeller.

Lætilia ephestiella Ragonot.

Dakruma ephestiella Ragonot, Diag. No. Am. Phycit. and Gall., p. 13, 1887.

Lætilia ephestiella Hulst, Trans. Am. Ent. Soc., xvii, p. 185, 1890.

Lasiosticha ephestiella Ragonot, Rom. Mem., viii, p. 110, 1901, Pl. I, fig. 3.

Laosticha ephestiella Hulst, Bull. 52, U. S. Nat. Mus., p. 431, 1902.

The name *Laosticha* is another error in preparing Dr. Hulst's manuscript for Bulletin 52. The name originally communicated to Dr. Hulst was evidently *Lasiosticha* Meyrick. But I can see no reason for referring the Arizonian species to this Australian genus. *Lasiosticha* is characterized by having a thick ridge of scales on the ♂ antennæ from base to middle, as stated in the text of Ragonot's monograph and shown in the figure,* while Ragonot says of *ephestiella*, ♂ antennæ simple, filiform, feebly pubescent. The venation is stated to be as in *coccidivora* Comstock, but vein 2 of hind wings a little before end of cell and vein 8 very short. I would refer it to *Lætilia* of which *Laosticha* (Ragonot) Hulst will become a synonym. The genus *Lasiosticha* Meyrick should be considered unrepresented in America.

Pectinigera ardiferella Hulst.

Altoona ardiferella Hulst, Ent. Amer., iv, p. 118, 1888.

Altoona ardiferella Hulst, Trans. Am. Ent. Soc., xvii, p. 208, 1890.

Tolima ardiferella Ragonot, Romanoff Mem., viii, p. 506, 1901.

Aurora nigromaculella Hulst, Journ. N. Y. Ent. Soc., viii, p. 224, 1901.

Saluria ardiferella Hulst, Bull. 52, U. S. Nat. Mus., p. 439, 1902.

This species cannot belong to *Tolima*, as vein 2 of the hind wings is distant from the angle of the cell, nor to *Aurora*, as vein 10 of fore wings is from the cell, nor to *Saluria*, as there is no frontal tubercle. *Altoona* is made a synonym of *Tolima* by Ragonot, but I have seen no male and cannot say whether the antennæ in this species have a tuft of scales or not. I assume that they do, in placing the species in *Pectinigera*, as the position to which Hampson assigns the species in the Romanoff Memoirs implies that such is the case.

Two small specimens from Mr. T. D. A. Cockerell from Mesilla Park, New Mexico, emerged August 4 and 11. They are labeled as follows:

"Bred from *Orthezia annæ* on *Atriplex canescens*. Larva

* Rom. Mem., viii, p. 109, Pl. XLVI, fig. 24, 1901.

in web, 8 or 9 mm. long. Head black; body dull white, the piliferous tubercles dark but not very conspicuous. First thoracic segment dark purplish at the sides, black or nearly so on the dorsum. Thoracic legs black." (Cockerell.)

Selagia lithosella Ragonot.

Selagia lithosella Ragonot, Diag., N. Am. Phycit., p. 9, 1887.

Selagia lithosella Hulst, Trans. Am. Ent. Soc., xvii, p. 160, 1890.

Selagia lithosella Ragonot, Rom. Mem., vii, p. 474, 1893.

Honora luteella Hulst, Journ. N. Y. Ent. Soc., viii, p. 223, 1901.

Selagia lithosella Hulst, Bull. 52, U. S. Nat. Mus., p. 426, 1902.

Honora luteella Hulst, Bull. 52, U. S. Nat. Mus., p. 433, 1902.

Hulst's type of *luteella* is before me and agrees with Ragonot's figure of *lithosella*. The species does not belong to *Honora*, having 8 veins in the hind wings, but agrees generically with the European *argyrella* Fab., the type of *Selagia*.

Cacotherapia, n. gen.

Fore wings with 12 veins, 2 well before the angle of the cell, 3 before the angle, 4 and 5 long-stalked, cell long, 6 well below the upper angle, 7 to 10 stalked, 7 to 9 close together on a long stalk, 7 from 8 beyond 9, 10 shortly stalked, 11 from cell. Hind wings with 7 veins, 2 from long before angle of cell, 3 and 4 separate, 6 from upper angle of cell, 7 and 8 anastomosing, the upper vein of the cell obsolete, resembling the discal vein. Labial palpi long, porrect; maxillary palpi and tongue invisible; ♂ antennæ thickened, slightly dentate, ciliate, a heavy scaling on costa of fore wings below at base.

Belongs to the Galleriinae near *Antipilotis* Meyrick, but differs in the obsolescence of the tongue, the long porrect palpi, etc.

Type: Aurora nigrocinereella Hulst.

Cacotherapia nigrocinereella Hulst.

Aurora nigrocinereella Hulst, Can. Ent., xxxii, p. 176, 1900.

Aurora nigrocinereella Hulst, Bull. 52, U. S. Nat. Mus., p. 438, 1902.

The locality "Texas" given by Hulst is erroneous. The specimens were bred from larvæ feeding on "*Lecanium* sp., on *Bigelovia douglassii*, American Fork, Utah (E. A. Schwarz). Received at Dept. Agriculture June 22, 1891, issued ♂ and ♀ July 7 and 8, 1891" (Dept. Agr., No. 5094).

This adds another to the list of carnivorous Lepidoptera.

—Mr. Heidemann presented the following paper :

NOTES ON NORTH AMERICAN ARADIDÆ, WITH DESCRIPTIONS OF TWO NEW SPECIES.

By OTTO HEIDEMANN.

Dr. A. D. Hopkins, who is in charge of the forest insect investigations of the Department of Agriculture, turned over to me for identification a lot of hemipterous insects belonging to the family Aradidæ. Some of these were collected by him on his trips to Florida and Texas, but the greater part of them by his assistant, Mr. W. F. Fiske, in North Carolina and Georgia during the year 1903. The collection represents four genera with thirteen well-known species. In addition there are two new species of the genera *Neuroctenus* and *Aneurus*.*

Subfamily ARADINÆ.

Aradus acutus Say.

Two specimens. A female taken at Tryon, N. C., April 17, 1903, beneath the bark of a rotten oak log; and a male, found at Everett, Ga., April 27, 1903, under dry bark of small dead oak.

On these specimens the cinereous spots on the dorsal part of abdomen show very distinctly. The species is not uncommon, frequently being found also around Washington, D. C.

Aradus similis Say.

Two specimens from Tryon, N. C., December 14 and April 9, 1903, beneath bark of elm, girdled last spring; also under bark of dead maple. This common species varies considerably in size. Even dwarf specimens are found.

Aradus crenatus Say.

Six specimens, males and females. All came from Tryon, N. C., April 4, 7, 17, 1903. Found beneath bark of tulip trees (*Liriodendron*), killed last summer; under loose bark of hickory (log dead one year), and beneath bark of maple trees, girdled one year. I once took at Cabin John, Md., numerous specimens of nymphs and adults, by sifting the decaying wood of an old tree stump.

Aradus niger Stal.

Three specimens, male and female, winged form. They were collected by Dr. A. D. Hopkins, at Kirbyville, Texas, November 17, 1902, under dead bark of long-leaf pine (*Pinus palustris*). This species was for a long time unrecognized, but specimens

*The notes on mode of occurrence are mostly taken from field notes furnished me by Dr. A. D. Hopkins.

have lately been compared with Stal's type by Dr. Ch. Aurivilius of Stockholm, and are now preserved in the U. S. National Museum collection.*

Aradus cinnamomeus Panzer.

One specimen, a winged male from Tryon, N. C. Common throughout the spring and early summer on a large pine tree, which had been girdled in March, but which was still alive. Many specimens were caught in the pitch that exuded from the wound. This small *Aradus* belongs also to the palearctic fauna.

Aradus falleni Stal.

A single female specimen, taken at light, May 30, 1903, at Tryon, N. C. This species has a wide range of distribution. Originally described from Rio Janeiro, Brazil, it occurs throughout South America, in Mexico and the West Indies, and has recently been recorded from nearly all of the Southern States. It is known, also, from Indian Territory and the District of Columbia.

Aradus breviatus Bergroth.

One example, a male, collected by Dr. A. D. Hopkins, on *Taxodium* at Baldwin, Fla. This species seems quite rare. I once took two specimens from the crevices of the bark of a living pine tree in the neighborhood of Washington, D. C.

Subfamily BRACHYRRHYNCHINÆ.

Brachyrrhynchus granulatus Say.

Numerous specimens from Tryon, N. C., March 6 and April 9, 1903; found on yellow pine trees, dead some years, and beneath bark of dead maples; on fresh pine boards, attracted with other insects by the odor of resin; and on November 17, 1903, beneath bark of chestnut felled last spring. It was also taken at Savannah, Ga., April 29, and at Cornelia, Ga., November 22, 1903, beneath dead and dry oak bark. The species is very abundant throughout the United States.

Neuroctenus simplex Uhler.

Many specimens, mostly from Tryon, N. C., March 9, November 17, 18, 1903, beneath bark of decaying oak log and beneath bark of oak, which died last summer. The species was also collected at Saluda, N. C., November 25, 1903, in large numbers beneath bark of oak trees girdled last spring; and at Lakeland, Fla., April 7, 1904, on live-oak. This is the commonest species of the *Aradids* known in the United States. Fresh specimens

* Note on *Aradus (Quilnus) niger* Stal. By O. Heidemann. Proc. Ent. Soc. Wash., IV, No. 4, p. 389, 1896-1901; and loc. cit., p. 411.

have the membranous parts of the elytra silvery-white with a short, dark streak at base, sometimes running down to the middle and forming an irregular spot.

***Neuroctenus pseudonymus* Bergroth.**

Neuroctenus pseudonymus Bergroth, Wien Ent. Zeit., xviii, p. 27, 1898.

One example, taken at Saluda, N. C., May 20, beneath bark of a decaying chestnut log. This species was originally described from North Carolina. I have taken it twice in the District of Columbia. It is more robust and broader in body than any other of the North American species of *Neuroctenus*.

***Neuroctenus elongatus* Osborn.**

Neuroctenus elongatus Osborn, Ohio Naturalist, iv, No. 2, p. 21, 1903.

Six specimens, males and females, found at Tryon, N. C., April 3, 1903, beneath bark of decaying chestnut log. Prof. Herbert Osborn kindly examined one of the male specimens and identified it as *N. elongatus*, recently described by him from one male specimen in his paper on *Aradidæ* of Ohio.* Having now a series of specimens of both sexes, I give the following description of the female:

♀.—Anterior process of head reaching very slightly over the apex of first antennal joint; process of the antenniferous tubercles acute; tubercles behind the eyes quite prominent. Pronotum twice as wide as its length; posterior margin nearly straight. Dorsal part of abdomen dark brown, with the lateral margin reddish brown, the posterior edges of the segments on the connexivum a little raised near the incisures. Lateral lobes of the genital segment, as seen from above, slightly longer than the middle lobe, which is obtusely rounded and not broader than the lateral lobes. Length 5.5 to 6 mm.; width 2.25 mm.

Of this species I possess also two examples from Greensburg, Pennsylvania.

***Neuroctenus hopkinsi*, n. sp.**

Dark brownish, irregularly granulated. Anterior process of head deeply notched at tip, reaching the apex of the basal antennal joint; process of the antenniferous tubercles very acute, divaricate; post-ocular part of head rounded, coarsely granulated, not tuberculated laterally. Antennæ as long as the posterior margin of pronotum, finely granulated; the basal joint stout, third joint somewhat more slender than the others and slightly longer, the fourth fusiform and yellowish at tip with a few long, fine hairs. Pronotum trapezoidal; the lateral margins slightly sinuated with the anterior angles rounded, somewhat prominent; posterior margin straight; surface coarsely granulated, a little raised at the an-

* The Ohio Naturalist, iv, No. 2, p. 41, December, 1903.

terior part with two small, glabrous spots near the anterior border. Scutellum broad triangular, rounded at tip with a faint indication of a carina; near the pronotal border is a shallow impression, where the granules are indistinct, arranged in longitudinal rows, while the posterior part of the scutellum is very coarsely transversely wrinkled. Corium more finely irregularly granulated and rugulose; the neuration of the membranous part of elytra very distinct; color black with two yellow spots at base near the scutellum, and one on each side next to the tip of corium. The lateral lobes of the female genitalia are rounded and exactly in the same line with the middle lobe, which is transverse and only a little broader than the lateral lobes. Male genital segment broad, oval, posterior margin more angulate and the lateral lobes very small.

Length of female 5.8 to 6.2 mm.; width of abdomen 2.8 mm.

Length of male 5.8 mm.; width 2.6 mm.

Hendersonville, N. C., May 26, 1903, found under bark of white pine, cut last winter.

Type.—No. 8048, U. S. National Museum.

This species is easily distinguished from *N. simplex* Uhler and from *N. elongatus* Osborn by the conspicuously rugose surface of the posterior part of the scutellum and by the differently shaped, slightly longer terminal genital segment of the male. It seems to be also allied to *N. amplus* Champion and *N. punctulatus* Burmeister, but differs from the former in having the post-ocular part of head not spinous nor tuberculate, and is distinguished from the latter species by the shorter antennæ.

I name the species in honor of Dr. A. D. Hopkins, who has contributed much to our knowledge of the hemipterous insects living under bark of trees.

***Aneurus minutus* Bergroth.**

Aneurus minutus Bergroth, Verh. Zool.-bot. Ges. Wien, 1886, p. 58.

Two specimens, male and female, from Brunswick, Ga., April 26, 1903; found in deserted galleries of a small Cerambycid in dead branches of sumac. This species is recorded from Mexico and the West Indies. I have also seen specimens from Arizona and Southern Florida.

***Aneurus simplex* Uhler.**

One example, a male, from Hoquiam, Washington State. This species has more slender antennæ than any other of the species, and the apical joint is very long. The original specimen is recorded by Prof. Ph. R. Uhler from New England.

***Aneurus fiskei*, n. sp.**

Reddish brown; finely granulate and rugulose. Head slightly longer than broad; front reaching to the middle of first antennal joint, spines of

the antenniferous tubercles acute and curved; part behind the eyes obtusely rounded, edged with a few fine granules; tubercles laterally obsolete. Antennæ not quite twice the length of head; basal joint very stout, broader than the frontal part of head; second joint oval like the basal one, but much smaller and not thicker than the two remaining joints, which are cylindrically formed; third joint nearly equal in length to the first; the terminal one a little longer than the third and second together, covered with fine hairs. Pronotum half as long as wide with a transverse furrow before the middle; the lateral margins anteriorly slightly sinuate; surface very finely granulate, posteriorly rugulose. Scutellum nearly as long as broad, having also the same length as the pronotum in the middle, more coarsely granulated with a short, faint carina anteriorly. The membranous part of elytra rugose and densely granulated, color black; near the middle of corium runs a transverse, yellowish spot, in some specimens obliterated. The terminal genital segment of male convex and long, but extending barely beyond the genital lobes.

Length of female 3.8 to 4 mm.; width 1.8 mm.

Length of male 3.6 to 3.8 mm.; width 1.6 mm.

Tryon, N. C., May 21, 1903 (W. F. Fiske, three specimens); Bedford Co., Pa., August 15, 1901; Paris, Fauquier Co., Va., July 27, 1898; Berkeley Springs, Va., August 20, 1891 (O. Heidemann), and Mount Airy, Ga., September 2, 1894 (E. A. Schwarz). Mr. Fiske's specimens were collected beneath bark of decaying branches of sour-wood (*Oxydendrum*) and also beneath loose bark scales on dry branches of sycamore. The other material was found on dry and decaying branches of trees.

Type.—No. 8049, U. S. National Museum.

This species has some similarity to *A. montanus* Champion, chiefly in the shape of the antennæ, but differs in being smaller and having the post-ocular part of head not spinous. I take pleasure in dedicating it to Mr. W. F. Fiske.

Mr. Heidemann stated, in this connection, that Prof. Herbert Osborn has in preparation a monograph of the Aradidæ. Dr. Hopkins asked Mr. Heidemann what constitutes the food of Aradids. Mr. Heidemann stated that, so far as known, Aradidæ appear to feed upon fungi. Dr. Hopkins said that this, also, was his opinion as to their food habits and he did not believe them insectivorous.* Dr. Ashmead stated that certain Proctotrypid parasites belonging to the genus *Aradophagus* infest the eggs of Aradidæ.

* A previous discussion on this subject is to be found in Proc. Ent. Soc. Wash., IV, No. 4, July 16, 1901, pp. 390 and 391.

—The following paper by Mr. Coquillett was read by title :

NEW NORTH AMERICAN DIPTERA.

By D. W. COQUILLETT.

At various times in the past few years, in the course of identifying specimens of Diptera for various correspondents, the writer has given manuscript names to new species, at the request of the senders, and as several of these names have since appeared in print, while others are shortly to be published, it is desirable to have these species characterized so as to give the names a standing. Accordingly the descriptions are appended herewith, together with those of several other species which are as yet apparently undescribed :

Family CHIRONOMIDÆ.

Ceratopogon medius, n. sp.

Near *varicolor*, but differs in the coloring of the legs, the presence of black bristles on the hind tibiæ, etc. Black, the face, mouth parts, joints two to seven of the antennæ, the halteres, abdomen, tarsi except the narrow apices of the joints, a ring before apex of each front femur and both ends of the front and middle tibiæ except their extreme apices, yellow. Eyes narrowly separated on the front. Thorax bluish gray pruinose. Front femora slightly thickened, each bearing four black spines on the under side, other femora without spines, first tarsal joint nearly twice as long as the second, the fourth joint dilated, bilobed at the apex, less than one-half as long as the fifth, the latter without spines on the under side, the two claws of each tarsus subequal in size. Wings bare, whitish hyaline, third vein separated from the first, not connected by a cross-vein, reaching three-fourths length of wing, apex of first vein a short distance before middle of the third, fourth vein forks almost opposite the small cross-vein. Length 2 mm.

Riverton, New Jersey. A female specimen collected on July 7 by Mr. C. W. Johnson.

Type.—No. 7942, U. S. National Museum.

Family CULICIDÆ.

Tæniorhynchus nigricans, n. sp.

Near *perturbans*, but smaller and darker, the first joint of the hind tarsi devoid of a median light colored band, etc. Deep black, a median band on the proboscis and the halteres yellow. Scales of palpi black, those at the apex white, appressed scales of occiput yellow, the upright ones brown. Mesonotum nearly covered with golden yellow scales, those of the abdomen black and with a lateral patch of whitish ones in the front angles of

segments two to seven, venter black scaled and with a broad fascia of whitish ones on the base of each segment. Legs black scaled, femora with a stripe of yellow ones toward the base of the posterior side, a few on the front side toward the base, a ring of whitish scales at three-fourths the length of the femora, scales at extreme apices of femora and bases of tibiæ whitish, tibiæ also with a narrow streak of whitish ones extending nearly the entire length of the posterior side, a broad band of whitish ones at two-thirds their length, those at the apex also whitish, tarsi with a rather narrow band of whitish ones at the base of each joint, tarsal claws not toothed. Wings hyaline, the scales brown the lateral scales of the veins broadly lanceolate, second submarginal cell much longer than the second posterior, about four times as long as its petiole. Length 3.5 mm.

Panama. Two females collected by Dr. J. W. Ross.

Type.—No. 7943, U. S. National Museum.

***Tæniorhynchus signipennis*, n. sp.**

Distinguished by the apical half of the costa of each wing being covered with light yellow scales with the exception of two patches of black ones.

♀.—Brown, varied with yellowish, the bases of the antennæ, a broad band at middle of the proboscis, the first tarsal joint except the apex and a ring near the base, also the bases of the following joints, very narrowly on the last two, yellow. Scales of palpi and the upright ones on the occiput mixed black and light yellow, the appressed scales of the occiput and mesonotum light yellow, those on the abdomen chiefly white, on the femora and tibiæ mixed black and light yellow, not forming distinct bands or spots, those on the tarsi black except at bases of the joints and the broad median portion of the first, which are chiefly whitish; on the second joint of the hind tarsi the whitish scales cover its basal half; tarsal claws not toothed. Wing-scales mixed black and light yellow, the former collected into three spots, two on the apical half of the costa and one on the sixth vein at a point near three-fourths of its length; scales on apical half of the costa and of the sixth vein wholly yellow with the exception of the patches of black scales; of the latter, the first one on the costa is slightly longer than the second and equals about one-half of the yellow interval between them; lateral scales of the veins varying from broadly oblanceolate to very narrow, almost linear; petiole of the first submarginal cell slightly longer than the cell; hind cross-vein nearly its own length before the small. Length 3 mm.

♂.—Palpi slender, brown, bases of last two joints and the preceding joint except its apex, yellow; proboscis reaching slightly beyond base of penultimate joint of palpi; hairs of antennæ golden yellow, many on the lower side brown. Scales of abdomen mixed brown and whitish. Front and middle tarsi bearing two teeth under one of the claws and one under the other, hind tarsal claws not toothed. Length 4 mm. Otherwise as in the female.

Monterey, Mexico. One female and four males (the latter much abraded), bred by Dr. Joseph Goldberger.

Type.—No. 8029, U. S. National Museum.

Culex nivitarsis, n. sp.

♀.—Black, the thorax and scutellum brown, the first antennal joint, halteres, coxæ, femora and tibiæ yellow, the hind tarsi white and with a faint median brownish band on the three middle joints. Scales of palpi brown, those on the basal portion yellow, on the apex white; scales of upper part of occiput golden yellow, on the sides and lower part chiefly white, those on the mesonotum golden yellow, on the abdomen purple, those on the extreme bases and front angles of the segments yellowish, including all on the seventh and following segments, those on the venter white. Scales of legs brown and whitish, not forming bands or spots, those on the first two pairs of tarsi brown and with white ones on the narrow bases and broad apices of the first two joints as well as on the narrow bases of the remaining joints of the middle tarsi; scales of the hind tarsi almost wholly white; all tarsal claws toothed. Wings grayish hyaline, the scales brown, lateral scales of the veins narrow and almost linear, petiole of first submarginal cell about two-thirds as long as this cell, hind cross-vein about its own length from the small. Length 4 mm.

♂.—Palpi slender, black, a broad band in middle of first joint and bases of the following joints white, proboscis reaching almost to apex of penultimate joint of palpi. Front and middle tarsi with one of their claws bidentate and the other unidentate, hind tarsal claws also unidentate; some of the brown bands on the hind tarsi quite distinct, especially the one on the third joint. Petiole of the first submarginal cell almost as long as that cell. Length 4.5 mm. Otherwise as in the female.

Paterson, New Jersey, May 12. A specimen of each sex submitted by Dr. J. B. Smith, to whom they have been returned.

Culex pullatus, n. sp.

♀.—Near *punctator* and *impiger*, but the bristles of the scutellum are chiefly black instead of yellow, etc. Black, the halteres and femora largely yellowish. Scales of palpi black, those on the occiput pale yellow, the upright ones in the middle yellow, those on the sides and the bristles black. Scales of the mesonotum golden yellow, the sides with a few lighter colored ones, the bristles and those of the scutellum chiefly black. Scales of abdomen black and with a tinge of violet, a crossband of whitish ones at base of each segment, dilated at each end, scales of venter whitish, a few black ones in hind angles of the segments. Scales of coxæ and on lower part of anterior, and posterior sides of the femora yellowish white, on upper part of femora and toward their apices chiefly black; scales of tibiæ blackish and mixed with a few yellowish ones, those on the tarsi blackish; all tarsal claws toothed. Wings hyaline, the scales brown, lateral scales of the veins narrow and almost linear, petiole of first sub-

marginal cell nearly as long as this cell, hind cross-vein about its length from the small. Length 4.5 mm.

♂.—Palpi slender, the scales and hairs black, the latter, like those of the antennæ, appear whitish in certain lights; proboscis reaching slightly beyond apex of palpi. Mesonotum with a pair of subdorsal bare vittæ on its anterior two-thirds. Abdomen with a cross-band on the apices of ventral segments 3 to 7. Petiole of the first submarginal cell longer than the cell. Otherwise as in the female.

Kaslo, British Columbia. One female and ten males bred from the larvæ, June 8 to 16, by Dr. H. G. Dyar; also ninety females and thirty-three males bred from the pupæ, or captured, by Dr. Dyar.

Type.—No. 8030, U. S. National Museum.

Although so similar to *punctor* and *impiger* in the adult state, the larva is very different, as Dr. Dyar has pointed out to me.

Family MYCETOPHILIDÆ.

Eugnoriste brevirostris, n. sp.

Black, the stems of the halteres yellow. Head narrow and elongated, about three times as long as wide, proboscis slightly longer than the head, slender, horny, over six times as long as wide. Wings grayish, apex of first vein a short distance before the forking of the fourth. Length 3.5 mm.

Halfway House, Pike's Peak, Colorado, September. A female specimen collected by Prof. T. D. A. Cockerell.

Type.—No. 7944, U. S. National Museum.

Acnemia varipennis, n. sp.

Yellow, the antennæ beyond the second joint, a circle around each ocellus, a spot in front of each wing the breast largely, a streak at each hind angle of the mesonotum, the margins of the scutellum except at the extreme apex, two longitudinal vittæ on lower half of metanotum, a spot in front of the halteres, the abdomen except bases of segments and the genitalia, the tarsi except their bases, and the knobs of the halteres, black; a pair of widely separated brownish subdorsal vittæ on the mesonotum; hairs and bristles chiefly yellow. Wings grayish hyaline, tinged with yellow along the costa, first section of third vein clouded with brown, a brown cross-band extends from apex of marginal cell to apex of third posterior cell, becoming grayish posteriorly, a large brown spot along under side of fifth vein before its apex. Length 5 mm.

Mountains near Claremont, Cal. A female specimen collected by Prof. C. F. Baker.

Type.—No. 8044, U. S. National Museum.

***Phronia tenebrosa*, n. sp.**

Black, the halteres and legs yellow, the last two pairs of coxæ, the hind edge of the front ones, a streak on under side of each femur near the base, the apices of the hind femora, and the tarsi except their bases, brown. Third joint of antennæ nearly twice as long as wide, the following joints becoming successively shorter to the fourteenth which is as wide as long, first joint slightly longer than wide, the second as wide as long; outer ocelli contiguous to the eyes. Body grayish pruinose, the hairs and bristles yellowish. Lateral bristles of tibiæ shorter than the diameter of the tibiæ. Wings hyaline, the apex from a short distance before apex of first vein to tip of lower fork of fifth vein, and a cloud below the latter, dark gray; auxiliary vein attenuated toward its apex, becoming obsolete slightly beyond middle of first basal cell, third vein strongly bowed toward the first, ending in the costa at an acute angle only a short distance before apex of costal vein, fourth vein forks at one-third of distance from the small cross-vein to the forking of the fifth vein. Length 2.5 mm.

San Mateo Co., Cal. A female specimen collected by Prof. C. F. Baker.

Type.—No. 8031, U. S. National Museum.

***Cælosia hypophora*, n. sp.**

Black, the first two joints of the antennæ, a large humeral spot, the hypopygium, halteres, coxæ, femora, tibiæ and bases of tarsi, yellow. First joint of antennæ shorter than the second, wider than long, the second as wide as long, the third three times as long as wide, the following joints increasing slightly in length to the eleventh, which is about six times as long as wide, the remaining joints decreasing in length to the last one, which is slightly shorter than the preceding joint; two outer ocelli separated from the eyes a distance equal to one-half of that between these ocelli. Body thinly grayish pruinose, the hairs yellowish, the bristles on sides of thorax and the hairs on the hypopygium chiefly brown; hypopygium very large, nearly globular, the two joints of each clasper subequal in length, the second joint with a long, downwardly directed process near the base of the under side; a large, subtriangular piece in the middle of the upper side of the hypopygium has its point of attachment on a line with that of the claspers and reaches about to the middle of the second joint of the latter. Lateral bristles of the tibiæ not or scarcely longer than the diameter of the latter. Wings grayish hyaline, auxiliary vein terminating in costa slightly before base of third vein, no auxiliary cross-vein, third vein strongly bowed forward toward its apex, costal vein extending slightly over half way from apex of third to that of the fourth vein, the latter forking midway between the small cross-vein and fork of the fifth. Length 3 mm.

San Mateo Co., Cal. Two male specimens collected by Prof. C. F. Baker.

Type.—No. 8032, U. S. National Museum.

Platyura pullata, n. sp.

Black, the mouth parts, sides of mesonotum, the scutellum, metanotum, hind margins of the abdominal segments, the genitalia, venter, coxæ, femora, tibiæ, bases of tarsi, and the halteres, yellow; hairs and bristles chiefly black. Thorax thinly gray pruinose, the abdomen polished. Wings hyaline, apex of auxiliary vein opposite base of the third, auxiliary cross-vein near one-fourth of distance from the humeral to apex of auxiliary vein, upper branch of third vein very oblique, terminating about its own length beyond apex of first vein, sixth vein prolonged to the wing-margin. Length 3.5 mm.

Claremont, Cal. A female specimen collected by Prof. C. F. Baker.

Type.—No. 8045, U. S. National Museum.

Family BIBIONIDÆ.

Bibiodes, n. gen.

Same as *Bibio* except that the third vein a short distance beyond its base coalesces completely with the fourth vein for a distance equal to the succeeding section of the fourth vein; the small cross-vein is therefore absent.

Type: The following species:

Bibiodes halteralis, n. sp.

♂.—Black, the halteres yellow, the hairs yellowish white. Body polished. Outer spur of front tibiæ very large, the inner one minute; hind tibiæ clavate, enlarging considerably toward the apex, hind tarsi somewhat swollen. Wings grayish hyaline, stigma brown, first and third veins and first section of the fourth, brown, remaining veins nearly colorless.

♀.—Like the male except that the front coxæ, all femora and the front and hind tibiæ are reddish yellow, the femora with a brown stripe on the upper and lower sides and the hind tibiæ with a similar stripe on the outer side. Length 3 mm.

San Mateo Co., Cal. (C. F. Baker); Los Angeles Co., Cal., Dec. 19, Jan. 12, and March 18 (D. W. Coquillett). Nine males and one female.

Type.—No. 8033, U. S. National Museum.

Family LEPTIDÆ.

Symphoromyia securifera, n. sp.

Black; the palpi, halteres, tibiæ and apices of femora yellow; hairs black, those on the occiput except along the upper edge, on the palpi, pleura, sides and venter of abdomen, coxæ and femora, white. Third

joint of antennæ two and one-half times as wide as long, over twice as wide as greatest width of the first joint; face bare. Head, first joint of antennæ, body, coxæ and femora opaque, grayish pruinose, mesonotum marked with three brown vittæ, the median one about one-fourth as wide as the gray space on either side of it; an oblong brown dorsal spot on abdominal segments two to five. Wings hyaline, the stigma pale brown. Length 5 mm.

Santa Clara Co., Cal. A female specimen collected by Prof. C. F. Baker.

Type.—No. 5034, U. S. National Museum.

Family BOMBYLIIDÆ.

Phthiria melanoscuta, n. sp.

Black, the sides of the front, posterior half of the cheeks, lateral and lower margins of the occiput, sides of the mesonotum, a broad vitta on upper edge and one below middle of pleura, connected by a cross-line below the wings, a spot above front coxæ, the hypopleura, halteres, abdomen, coxæ, femora, tibiæ and bases of tarsi, yellow (antennæ wanting). Head polished, face and cheeks almost bare, proboscis about six times as long as the head, palpi slender, linear, nearly as long as the head. Hairs of body whitish, scutellum and the black portion of the mesonotum opaque, velvety. Wings hyaline, stigma grayish, last two sections of fifth vein subequal in length. Length 2.5 mm.

Dripping Springs, Organ Mts., N. M. A female specimen collected in September, 1899, by Prof. T. D. A. Cockerell.

Type.—No. 5013, U. S. National Museum.

Phthiria fulvida, n. sp.

Yellow, a large spot on either side of the face which extends considerably on the cheek and slightly on the front, the third antennal joint except its base, the mouth parts, center of occiput, an ocellar dot, middle of metanotum and apices of tarsi, black; three vittæ on the mesonotum, a few spots on the upper and lower portions of the pleura, and the narrow bases of some of the abdominal segments, reddish yellow. First two joints of antennæ of nearly an equal length, the second wider than long, the third about four times as long as the first two taken together, its upper and lower edges almost parallel, but converging toward the apex which is deeply emarginate; proboscis about twice as long as the head, palpi rather robust, dilated toward the apex, reaching slightly beyond apex of second antennal joint; head polished, face and cheeks almost bare. Hairs of thorax and scutellum yellowish, mesonotum somewhat polished. Wings hyaline, apical half of subcostal cell yellowish, last two sections of fifth vein subequal in length. Length 3.5 mm.

Frontera, Tabasco, Mexico. A female specimen collected at light, April 30, by Mr. C. H. T. Townsend.

Type.—No. 8014, U. S. National Museum.

***Phthiria marginata*, n. sp.**

Head yellow, a spot on either side and another above the insertion of the antennæ, an ocellar dot, and center of the occiput, black; antennæ and mouth parts black, antennæ formed as in *fulvida*, proboscis a little over twice as long as the head, palpi very slender, only slightly dilated toward the apex, reaching slightly beyond apex of second antennal joint. Body black, opaque, gray pruinose, sides of mesonotum, spots on the pleura, the scutellum except a median vitta which is dilated at the base, and the hind margins of the abdominal segments both dorsally and ventrally, yellow; mesonotum with a pair of whitish pruinose vittæ near the middle, hairs of body whitish. Legs dull yellowish, apices of tibiæ and the tarsi except their bases, brown. Wings hyaline, stigma grayish, last two sections of fifth vein of nearly an equal length. Length 3 mm.

Pecos, New Mexico. A female specimen collected on September 4 by Prof. T. D. A. Cockerell.

Type.—No. 8015, U. S. National Museum.

***Phthiria vittiventris*, n. sp.**

Head and its members as in *marginata* except that the black of the occiput is more extended and at the upper corners sends a spur to each eye, while the proboscis is over three times as long as the head. Body black, the sides of the mesonotum, a large spot in front of the scutellum, several spots on the pleura, the scutellum except a line below the outer edge, a pair of broad subdorsal vittæ on the abdomen, and the middle of the venter, yellow; mesonotum opaque, grayish pruinose and with a pair of whitish pruinose subdorsal vittæ, black of abdomen somewhat velvety, hairs of body chiefly yellowish. Legs yellow, the front and hind femora except their ends, the apices of the tibiæ, and the tarsi except their bases, brown. Halteres yellow. Wings hyaline, last two sections of fifth vein of nearly an equal length. Length 2 mm.

Pecos, N. M., Aug. 29 (T. D. A. Cockerell); Las Vegas Hot Springs, N. M., Aug. 3 (H. S. Barber). Two female specimens.

Type.—No. 8016, U. S. National Museum.

***Phthiria nubeculosa*, n. sp.**

Head yellow, a spot on either side of the antennæ, another on posterior half of each cheek, an ocellar dot and the center of the occiput, black; antennæ black, the first joint chiefly yellow, slightly longer than the second, each wider than long, the third elongate-oval, about three times as long as the first two, deeply emarginate at the apex; mouth parts black, proboscis slightly over twice as long as the head, palpi considerably enlarged toward the apex, almost reaching the tip of the antennæ. Body

black, the sides of the mesonotum, several spots on the pleura, the scutellum except a pair of basal spots, and the hind margins of the abdominal segments both dorsally and ventrally, yellow; hairs whitish, body gray pruinose, mesonotum marked with a pair of whitish pruinose subdorsal vittæ. Legs yellow, tarsi except their bases brown. Halteres yellow. Wings hyaline, stigma pale gray, a faint, almost imperceptible brownish cloud on the veins and cross-veins at bases of the submarginal and posterior cells, last two sections of fifth vein of nearly an equal length. Length nearly 2 mm.

Las Cruces, New Mexico. A female specimen collected by Prof. T. D. A. Cockerell.

Type.—No. 8017, U. S. National Museum.

***Phthiria inornata*, n. sp.**

Head yellow, a spot on either side of the antennæ, another on the posterior half of either cheek, the ocellar triangle and the occiput except the lower part, black; face and cheeks polished, nearly bare; antennæ black, formed as in *nubeculosa* (mouth parts wanting). Body black, gray pruinose, mesonotum not vittate, the sides narrowly, a few spots on the pleura, the scutellum except two brown vittæ, and the hind margins of abdominal segments 2 to 7, yellow, hairs yellowish. Legs brown, the tibiæ and bases of tarsi yellow. Halteres brown, the stems yellow. Wings hyaline, a distinct brown cloud on veins and cross-veins at bases of the submarginal and posterior cells, at apex of anal cell, and on the second vein, above the small cross-vein; a small, indistinct cloud near apex of second vein; stigma pale gray; last section of fifth vein somewhat longer than the preceding section. Length 2 mm.

Texas. A male specimen collected by Belfrage.

Type.—No. 8018, U. S. National Museum.

***Phthiria badia*, n. sp.**

Yellow, a spot on either side of the antennæ, another on the posterior half of either cheek, the ocellar triangle, the antennæ and mouth parts except base of the former, the occiput except the lower portion, and the middle of the metanotum, black; the mesonotum except the sides and two short streaks at the front end, deep reddish brown; the breast and a few spots on the pleura reddish yellow, tarsi, except at bases, brown. First two joints of antennæ of nearly an equal length, each wider than long, the third somewhat more than three times as long as the first two, the upper and lower edges only slightly convex, the apex emarginate; proboscis about twice as long as the head, palpi rather robust, enlarging gradually toward the tip, reaching slightly beyond apex of second antennal joint. Body opaque, not grayish pruinose, hairs of thorax light yellowish. Wings hyaline, apical half of subcostal cell yellowish, an indistinct brownish cloud on the veins and cross-veins at bases of the second sub-

marginal and of the posterior cells, last two sections of fifth vein of nearly an equal length. Length 3.5 mm.

Brownsville, Texas. A male specimen collected in May by Mr. C. H. T. Townsend.

Type.—No. 8019, U. S. National Museum.

***Phthiria picturata*, n. sp.**

Yellow, the antennæ, mouth parts, center of occiput prolonged as a vitta over the ocelli and as far as the antennæ, the sides of the oral opening narrowly, three vittæ on the mesonotum (the median one abbreviated posteriorly and greatly dilated anteriorly, the lateral ones abbreviated anteriorly and emarginate on the outer edge near the transverse suture), a small spot above each wing, several on the pleura, the metanotum, bases of the abdominal segments, and the legs except the coxæ and median portion of the middle femora, black. Head and body polished, hairs of head, many on the mesonotum and those of the scutellum, black, hairs of cheeks very sparse and bristle-like. First two joints of antennæ of nearly an equal length, the second wider than long, the third narrow and almost linear, about four times as long as the first two, emarginate at the apex; proboscis nearly four times as long as the head, palpi narrow, about one-fifth as long as the proboscis. Wings hyaline, stigma grayish, last two sections of fifth vein of nearly an equal length. Length 3 mm.

Pecos, N. M., August 25, and Mescalero, N. M. Two females collected by Prof. T. D. A. Cockerell.

Type.—No. 8020, U. S. National Museum.

***Phthiria flaveola*, n. sp.**

Yellow, the proboscis except at base, black, apices of antennæ and of tarsi brown, mesonotum except the sides and a spot in middle of the posterior end, yellowish brown, extreme bases of many of the abdominal segments also yellowish brown, the hairs yellowish. Head and body opaque, mesonotum thinly gray pruinose. Cheeks nearly bare, first two joints of antennæ of nearly an equal width, each wider than long, the third about four times as long as the first two, considerably tapering on the apical half, the narrow apex emarginate; proboscis slightly over twice as long as the head, palpi slender, considerably enlarged toward the apex, about one-fifth as long as the proboscis. Wings hyaline, stigma grayish, last two sections of fifth vein of nearly an equal length. Length 3.5 mm.

San Marcial, New Mexico (T. D. A. Cockerell); Merced Co., Cal. (D. W. Coquillett). Two female specimens.

Type.—No. 8021, U. S. National Museum.

***Phthiria amplicella*, n. sp.**

Head yellow, ocellar triangle and occiput except its lower edge black, the hairs whitish, those of the cheeks rather long and quite abundant; antennæ yellow, the third joint except at the base brown, first joint

slightly longer than the second, the latter wider than long, the third over four times as long as the first two, nearly straight on the lower edge but convex on the upper, emarginate at the apex, the hairs along its upper edge very short and sparse; proboscis black, somewhat more than twice as long as the head, palpi yellow, slender, slightly enlarged toward the apex. Thorax black, thinly grayish pruinose, the humeri and a spot at base of wings yellow, hairs whitish; scutellum yellow, the bases of the sides and the under surface black. Abdomen black, apices of the segments yellow. Legs yellow, greater part of coxæ and apices of tarsi brown. Halteres yellow. Wings whitish, unusually broad, discal cell very large, last section of fifth vein less than one-half as long as the preceding section. Length 3.5 mm.

Texas. A male specimen.

Type.—No. 8022, U. S. National Museum.

***Phthiria bicolor*, n. sp.**

♂.—Black, the humeri, scutellum except under side and sides at base, hind margins of the abdominal segments except the first, lower half of hypopygium, and the halteres except upper side of the knobs, yellow, knees of the front and middle legs broadly yellowish brown. Frontal triangle gray pruinose, sides of face polished and nearly bare; first two joints of antennæ subequal in length, each slightly broader than long, the third joint nearly four times as long as the first two taken together, its upper and lower edges almost parallel, the apex deeply emarginate and bearing a short style in the middle of the emargination; proboscis three times as long as the head, palpi nearly reaching middle of the third antennal joint, very slender and almost linear. Body opaque, the genitalia polished, hairs chiefly whitish, mesonotum somewhat velvety, the sides and front end grayish pruinose. Wings hyaline, stigma obsolete, small cross-vein near middle of discal cell, last two sections of fifth vein subequal in length.

♀.—Black, the head except center of occiput, the sides of the mesonotum, a vitta through middle of pleura, the scutellum except under surface and sides toward the base, hind margins of abdominal segments both dorsally and ventrally, also the halteres, yellow. Mesonotum bluish gray pruinose. Otherwise as in the male. Length 2.5 mm.

Rio Ruidoso, White Mts., N. M., July 27 (C. H. T. Townsend); Filmore Canyon, Organ Mts., N. M., August 29 (C. H. T. Townsend); and Pecos, N. M., in August (Mrs. W. P. Cockrell). One male and two females.

Type.—No. 8023, U. S. National Museum.

***Acreotrichus atratus*, n. sp.**

Black, the halteres and hind margins of ventral segments yellow, hairs black. First joint of antennæ slightly longer than the second, distinctly longer than wide, the third joint rather slender and of nearly an equal width, about three times as long as the first two taken together, the upper

edge bearing about a dozen long bristly hairs, the apex deeply emarginate and with a short style in the middle of the emargination; proboscis about two and one-half times as long as the head, palpi slender and linear, reaching about to base of the third antennal joint. Head, thorax and scutellum very thinly grayish pruinose, the mesonotum with a median and lateral vitta of lighter gray. Wings grayish hyaline, tinged with yellowish toward the base and costa, apical half of subcostal cell yellow, small cross-vein slightly beyond middle of discal cell, last section of fifth vein longer than the preceding section. Length 5 mm.

Head of Rio Piedres Verdes, Sierra Madre, Chihuahua, Mexico, August 16 (C. H. T. Townsend). A male specimen.

Type.—No. 8024, U. S. National Museum.

Family THEREVIDÆ.

Psilocephala aurantiaca, n. sp.

Black, the base of the third antennal joint, halteres, apices of femora, and the tibiæ except their apices, dull yellow; palpi pale yellow, segments 2 to 5 of abdomen and the apex of the first reddish yellow; frontal triangle and face silvery white pruinose; third joint of antennæ subequal in length to the first two and about twice as wide, less than twice as long as wide; thorax somewhat opaque, grayish pruinose, not distinctly vittate, its hairs golden yellow, those on lower part of pleura and in front of the halteres white; scutellum gray pruinose, bearing two bristles; abdomen polished, the hind angles of the first segment and hind margins of the second, third, fifth and sixth segments, white pruinose, hypopygium rather large; wings hyaline, somewhat grayish along the costa, stigma brown, fourth posterior cell broadly open. Length 5.5 mm.

Claremont, Cal. A male specimen collected by Prof. C. F. Baker.

Type.—No. 8035, U. S. National Museum.

Family ASILIDÆ.

Leptogaster virgatus, n. sp.

Readily recognized by the three polished vittæ on the otherwise pruinose mesonotum. Head black, grayish pruinose, antennæ yellow, the arista black, mystax and the slender bristles on upper part of occiput white; thorax reddish brown, light gray pruinose except three polished vittæ on the mesonotum; abdomen black, brownish pruinose, the first segment and both ends of the others light gray pruinose; legs yellow, a broad band before apex of hind femora and apical half of hind tibiæ brown, apices of tarsi yellowish brown, empodia spine-like, about half as long as the claws; wings hyaline, the apex narrowly gray, base of fourth posterior cell with a long peduncle. Length 13 mm.

Washington, D. C., June 22 (Nathan Banks); Texas (Bel-frage). Three female specimens.

Type.—No. 7945, U. S. National Museum.

***Leptogaster hirtipes*, n. sp.**

Near *murinus*, but with a conspicuous patch of snow-white hairs on the under side of the penultimate fifth of the hind femora. Head black, light gray pruinose, antennæ yellowish, the arista brown, mystax white, bristles on upper part of occiput rather stout and chiefly black; thorax black, the four corners yellowish, light gray pruinose, mesonotum with three brown pruinose vittæ; abdomen black, brownish pruinose, the first segment and both ends of the others gray pruinose; legs yellowish, the enlarged portion of hind femora and apical portion of hind tibiæ yellowish brown, apices of tarsi brown, empodia spine-like, about half as long as the claws; wings hyaline, base of fourth posterior cell with a short peduncle. Length 11 to 14 mm.

Colorado (Morrison), and Rio Ruidosa, White Mts., N. M., altitude about 7,600 feet, August 2 (C. H. T. Townsend). Two males and two females.

Type.—No. 7946, U. S. National Museum.

***Ablautus flavipes*, n. sp.**

Black, the abdomen except at base, the halteres and legs, yellow, apices of the femora, of the tibiæ and of the tarsi, also a vitta on upper side of front femora, brown; hairs of head white, bristles of lower side of first two joints of antennæ and on upper part of occiput, yellowish white; hairs of body white, bristles of thorax pale yellow, abdomen densely yellowish gray pruinose, usually marked with a median and a lateral row of brown spots; hairs and bristles of legs white, the sides of the last three joints of the front tarsi in the male with a cluster of black hairs, giving these joints the appearance of being dilated, the bristles of these joints black; wings hyaline, the veins chiefly yellow. Length 5 mm.

Los Angeles and San Diego Cos., Cal. Three males and two females, collected by the writer in May.

Type.—No. 7947, U. S. National Museum.

***Ablautus rubens*, n. sp.**

Reddish yellow, the hairs and bristles whitish, several on the tarsi black, most numerous on the hind ones; head, thorax and scutellum opaque, yellowish gray pruinose, the pleura except the anterior portion, the under side of the scutellum and middle of the metanotum, polished; abdomen polished, a pair of small gray pruinose spots on the second and third segments, sides of abdomen and the venter yellowish gray pruinose; wings hyaline. Length 6 mm.

Washington State. A female specimen received from Prof. O. B. Johnson.

Type.—No. 7948, U. S. National Museum.

***Stenopogon nigrutilus*, n. sp.**

Black, the first two joints of antennæ, halteres, genitalia, and legs except the coxæ and a vitta on each femur, reddish yellow, the hairs and bristles yellowish white; third joint of antennæ about three times as long as the style; mesopleura and hypopleura bare, abdomen thinly gray pruinose; wings hyaline, veins brown, first and fourth posterior cells broadly open. Length 10 to 13 mm.

Los Angeles and Kern Cos., Cal. Three males and four females, collected by the writer in July.

Type.—No. 7949, U. S. National Museum.

The genus *Stenopogon* was founded by Loew as a section of the old genus *Dasyopogon*.^{*} He gave a rather extended description of it under the caption “3te Gruppe des *Das. sabaudus*.—*Stenopogon*,” and treated of six European species, of which *sabaudus* is the sixth and last. It is evident from his heading, quoted above, that Loew considered this latter species as being the type of this group or genus, and it should therefore be accepted as such.

In July, 1866, Loew established a closely related genus under the name of *Scleropogon* † for a new species from California which he named *picticornis*; he stated that this genus resembles *Stenopogon* in several particulars, but differs in the narrower face and front, shorter third antennal joint, longer style, also in having the first posterior cell closed before the margin of the wing and the third posterior cell greatly dilated—all of them relative characters which are seldom alike in any two species, and many of the characters mentioned are found to vary considerably in the different specimens of the same species.

A recent comparison of specimens which I identified as *picticornis*, with Italian specimens of *sabaudus* received from Prof. M. Bezzi resulted in the firm conviction that the most pronounced difference existing between them is to be found in the nature of the hypopleura which is bare in *sabaudus*, but nearly covered with bristles and hairs in *picticornis*. Wishing to ascertain if Loew's type of *picticornis* was identical in this respect with the specimens I had referred to this species I applied to Mr. Samuel Henshaw, the Curator of the Museum of Comparative Zoology at Cambridge, Mass., who, under date of May 17, 1904, wrote as follows: “Loew's type of *Scleropogon picticornis* has a

^{*} Linnæa Entomologica, II, p. 453. 1847.

† Berliner Ent. Zeit., x, p. 26.

cluster of bristles and hairs in front of the halteres"—that is, on the hypopleura, agreeing in this respect with my specimens.

An examination of a large series of North American specimens belonging to nineteen different species in these two genera shows that this character is equally marked in all of them, the hypopleura being either quite bare, or else nearly covered with bristles and hairs; it will therefore be advisable to employ this character in separating these two genera in place of the variable and unsatisfactory characters taken from the antennæ and wings which have heretofore been employed for this purpose.

Laphystia flavipes, n. sp.

Black, the halteres, and femora and tibiæ except their apices, yellow, the hairs and bristles whitish; second joint of antennæ about two-thirds as long as the first, the third as long as the first two together, rather slender, gradually tapering to the apex, the second joint of the style wider than the first, only slightly longer than wide; head and body densely gray pruinose, somewhat yellowish on the face, front and mesonotum, the broad front portion of the abdominal segments two to six except on the sides, and the narrow hind margins of the first five segments, polished; wings hyaline, the auxiliary, first vein and bases of the others, yellow, remainder of the latter brown. Length nearly 10 mm.

Montana and North Carolina. Two males collected by H. K. Morrison.

Type.—No. 7950, U. S. National Museum.

Laphystia limatula, n. sp.

Differs from *flavipes* as follows: Second joint of antennæ nearly as long as the first, the third robust, of nearly an equal width; mesonotum not gray pruinose except along the lateral and posterior margins, that on the abdomen very thin, broad posterior ends of the last five segments reddish yellow.

La Luz, New Mexico. A male specimen collected August 23 by Mr. C. H. T. Townsend.

Type.—No. 7951, U. S. National Museum.

Laphystia opaca, n. sp.

Black, the halteres, bases of tibiæ and of the hind femora, yellow, the hairs and bristles whitish; second joint of antennæ about half as long as the first, the third broad and only slightly tapering to the apex; head and body densely grayish pruinose, three broad vittæ on the mesonotum and a subtriangular spot at middle of base of abdominal segments two to six, polished; the median vitta of the mesonotum is on its anterior third; wings hyaline; auxiliary vein and bases of the others yellow, remainder of the latter brown. Length 8 mm.

Padre Island, Texas. A male specimen collected June 29 by Mr. C. H. T. Townsend.

Type.—No. 7952, U. S. National Museum.

Dioctrodes, n. gen.

Near *Dioctria*, but the face gently convex, antennæ not inserted upon a protuberance, etc. Head twice as broad as high, front slightly widening upwardly, face bare above the mystax, bristles of the latter nearly in a single row, an isolated bristle above each lower corner of the face, oral margin scarcely projecting; antennæ twice as long as the head, the first joint one and one-third times as long as the second, the third more than twice as long as the first two together, of nearly a uniform width, bearing a small, forwardly directed spine a short distance in front of the middle of the upper side and with a slight depression just beyond the spine, style not apparent; body slender, scutellum bearing a marginal pair of bristles, otherwise bare, abdomen almost bare, legs rather slender, bearing a few slender bristles, otherwise almost bare, front tibiæ devoid of a terminal claw, pulvilli large; marginal, submarginal, posterior and anal cells open, fourth posterior cell separated from the second basal by a cross-vein.

Type: the following species:

Dioctrodes flavipes, n. sp.

Black, the halteres, femora, tibiæ except apices of the hind ones, and bases of the tarsal joints, yellow, the hairs and bristles whitish; head grayish pruinose, the front except the narrow lateral margins and center of face, polished. Thorax yellowish pruinose inside of the humeri, at base of wings, on hind margin of mesonotum, on the pleura and metanotum; scutellum with a median vitta and the under surface yellowish pruinose; mesopleura, sternopleura and pteropleura bare. Abdomen punctured, not pruinose except a small spot at hind angles of the first five segments. Femora nearly bare, a few hairs and bristles on the under side. Wings hyaline, the veins brown. Length 7 mm.

Missouri. A male specimen, collected June 19.

Type.—No. 7953, U. S. National Museum.

Metapogon, n. gen.

Near *Cyrtopogon*, but the face is nearly flat, only slightly swollen on the lower part, the mystax very sparse except along the oral margin and composed chiefly of bristles, etc. Head unusually broad, over twice as broad as high, deeply excavated on the vertex, ocellar tubercle very prominent, front only slightly widening upwardly, at its lower end about three-fifths as wide as either eye, face slightly widening below, subequal in width to the front, eyes unusually prominent (nearly as in *Holcocephala abdominalis*); antennæ less than twice as long as length of head, first joint subequal in length to the second, the latter as wide as long, each

bearing a stout bristle on the under side, third joint nearly twice as long as the first two together, slightly widening outwardly, about five times as long as its greatest width, style less than half as wide as the third joint and at most one-third as long; proboscis straight, tapering to the tip. Mesonotum greatly swollen, provided with strong bristles. Abdomen subcylindrical. Femora with long but slender bristles on the under side, tibiae and tarsi with strong bristles, front tibiae devoid of a stout spur at the apex, pulvilli well developed, hind tibiae and their tarsi somewhat thickened, but not unusually thick. Marginal, submarginal and posterior cells open, the anal open or closed in the margin, the fourth posterior with a cross-vein at its base, the fifth separated from the discal by the fourth.

Type: M. gilvipes, n. sp.

Metapogon gilvipes, n. sp.

Black, the first two joints of the antennae and the legs except the tarsi toward their apices, brownish yellow, the halteres light yellow. Mystax yellowish, its bristles arranged in three rows on lower half of face, bristles of occiput whitish, those of the ocellar tubercle black. Antennal style about one-third as long as the third joint. Bristles of mesonotum black, the hairs very short and sparse, bristles and hairs of hypopleura white, mesopleura, pteropleura and sternopleura bare; scutellum rather flat, nearly bare, with a subapical pair of stout bristles. Abdomen yellowish gray pruinose, the hind margin of the first segment, a large triangular spot on the five succeeding segments, covering nearly the whole of the hind end of each segment and prolonged nearly across the segment in the middle, also the whole of the seventh segment and the genitalia, polished. Hairs and bristles of the femora white, bristles of the tibiae and tarsi dark brown, tarsal claws black. Wings hyaline, veins and cross-veins beyond base of first submarginal cell indistinctly bordered with pale brown; small cross-vein near three-fourths of the length of the discal cell. Length 6.5 mm.

Los Angeles Co., Cal. A female specimen collected by the writer.

Type.—No. 7954, U. S. National Museum.

Metapogon punctipennis, n. sp.

Black, the first two joints of antennae, the tibiae, bases of tarsi, and extreme apices of femora, reddish yellow, the halteres pale yellow, all hairs and bristles white. Antennal style about one-fifth as long as the third joint, mystax ascending to about three-fourths height of face. Mesonotum grayish pruinose, marked with a submedian pair of black vittae which extend from the front end three-fourths of the distance to the scutellum, also with a pair of blackish spots on either side, separated by the suture, hairs of mesonotum very short and sparse, mesopleura, pteropleura and sternopleura bare, scutellum flattened, nearly bare, thinly grayish pruinose,

bearing a subapical pair of stout bristles. Abdomen polished, first segment gray pruinose on the base and sides, second with a gray pruinose fascia near the base and an oblique spot in each hind angle, segments three to six each with a gray pruinose fascia at the base connected at either end with an oblique spot that extends to the hind angle of the segment, the spots on the third segment of the female separated from the fascia; each of these fasciæ is rather strongly narrowed in the middle of the posterior side; a gray pruinose spot on either side of the seventh segment. Wings hyaline, veins and cross-veins at bases of the discal, posterior and submarginal cells distinctly but rather narrowly clouded with brown, small cross-vein near two-thirds length of the discal cell. Length 7 mm.

Organ, New Mexico. A specimen of each sex collected by Prof. T. D. A. Cockerell.

Type.—No. 7955, U. S. National Museum.

Cyrtopogon nigricolor, n. sp.

Near *rattus*, but the bristles of the tibiæ are black, the abdomen is largely polished, etc. Black, the halteres yellowish, the knees narrowly brownish yellow. Hairs of the front whitish, on the vertex mixed with black, bristles of upper part of occiput black, hairs of the lower part white, mystax mixed white and black, mounting nearly to the antennæ, face strongly convex; first joint of antennæ slightly longer than the second, the latter with a pair of stout black bristles on the under side, third joint one and one-fourth times as long as the first two taken together, strongly constricted a short distance beyond the base and considerably narrowed at the apex, about three times as long as the slender style. Bristles of the body and on the tibiæ and tarsi black. Brown vittæ of mesonotum diffuse, the hairs sparse and rather short. mesopleura, pteropleura and sternopleura bare, hairs of hypopleura chiefly black; scutellum flat, yellowish gray pruinose, almost bare, with six strong marginal bristles. Abdomen polished, sides of first segment, bases and hind angles of the three following ones, gray pruinose (the remaining segments may also have had similar markings but these do not now appear, possibly owing to the partial greasing of the specimen). Tarsal claws black. Wings hyaline, the apical half faintly tinged with yellowish, small cross-vein slightly beyond middle of discal cell. Length 9 mm.

Los Angeles Co., Cal. A female specimen collected by the writer in June.

Type.—No. 7956, U. S. National Museum.

Cyrtopogon tibialis, n. sp.

Near *plausor*, but the mystax is black and rather sparse, not concealing the ground color, scutellum flat, etc. Black, the halteres yellow, the tibiæ,

bases of tarsi and extreme apices of femora, reddish yellow. Hairs of front and on upper edge of occiput black, on remainder of occiput white; third joint of antennæ slightly longer than the first two joints taken together, greatly widening medially, two and one-third times as long as the rather slender arista; face strongly gibbous. Mesonotum gray pruinose, marked with a pair of submedian brown vittæ not extending on the posterior portion, and on either side with a pair of large brown spots separated by the suture, hairs sparse and rather short, bristles black, mesopleura and sternopleura hairy, pteropleura bare, hairs of hypopleura whitish, scutellum gray pruinose on the upper surface, sparsely covered with rather long black hairs most abundant around the margin, devoid of stout bristles. Abdomen polished, with a bluish tinge on the first five segments, a gray pruinose fascia on hind part of the first six segments, that on the first and sixth broadly interrupted in the middle. Hairs of coxæ and femora white, bristles of tibiæ and tarsi black, tarsal claws whitish, their apical third black. Wings hyaline, small cross-vein near one-third length of discal cell. Length 9.5 to 11 mm.

Arizona. Three females collected by H. K. Morrison.

Type.—No. 7957, U. S. National Museum.

Cyrtopogon maculosus, n. sp.

Near *rejectus*, but the wings distinctly spotted, thorax with a crest of hairs, etc. Black, including the halteres. Face strongly gibbous, mystax black, rather dense, mounting nearly to the antennæ; third joint of antennæ one and one-fourth times as long as the first two taken together, gradually tapering to the apex, three times as long as the robust style; hairs of front and on upper edge of occiput chiefly black, on remainder of occiput whitish. Thorax with the usual brown markings, a median crest of rather long black hairs, bristles black and rather slender; mesopleura and sternopleura hairy, pteropleura bare, hairs of hypopleura whitish; scutellum strongly convex, yellowish gray pruinose, rather densely covered with long white hairs and with a row of slender black bristles around the margin. Abdomen polished, the lateral margins narrowly gray pruinose, produced inward a short distance at the hind angles of each segment. Hairs and bristles of legs chiefly whitish, tarsal claws black. Wings hyaline, a distinct brown cloud on veins and cross-veins at bases of the submarginal, discal and posterior cells, small cross-vein near middle of discal cell. Length 10 mm.

Pullman, Washington. A female specimen collected April 29, 1902, by Prof. C. V. Piper.

Type.—No. 7958, U. S. National Museum.

Cyrtopogon varipennis, n. sp.

Near *nebulo*, but the first basal cell marked with two black spots near the middle, etc. Black, the halteres dull yellow. Face rather strongly

convex, mystax black, somewhat sparse, hairs of front and on upper part of occiput chiefly black, those on remainder of occiput whitish; third joint of antennæ slightly longer than the first two, gradually tapering to the apex, only slightly longer than the rather slender style. Mesonotum quite densely covered with rather long erect black hairs, the bristles scarcely longer or stouter than the hairs; mesopleura and sternopleura hairy, pteropleura bare, hairs of hypopleura mixed black and white; scutellum convex, not pruinose, the upper surface rather densely covered with long whitish hairs, the many marginal bristles very slender, chiefly white but several are brown on the basal portions. Abdomen polished, the hind angles of the first six segments marked with a gray pruinose spot. Hairs and bristles of legs whitish, many of the bristles with brown bases, tarsal claws black. Wings gray, with a few hyaline spots and streaks, the costa from apex of auxiliary vein to apex of upper branch of the third broadly bordered with brown, a dark brown spot in base of first submarginal cell extending across the marginal, one in base of second submarginal, first and second posterior, and two near middle of first basal cell; of the last two spots one is along the basal part, the other along the apical portion of the prefurca of the third vein; the brown spot on the small cross-vein extends to apex of discal cell; small cross-vein slightly beyond middle of discal cell. Length 7 to 10 mm.

Washington State. One male and two females collected by Prof. O. B. Johnson.

Type.—No. 7959, U. S. National Museum.

Saropogon luteus, n. sp.

Reddish yellow, apices of antennæ brown, the proboscis on apex and upper side black, all hairs and bristles yellowish; head except on the vertex, yellow pruinose, pleura and sides of thorax in front of the humeri yellowish pruinose, abdomen polished, hind angles of segments two to five yellowish pruinose; wings brownish along the veins and in the costal cell, fourth posterior cell rather broadly open. Length 11 to 17 mm.

Claremont, Cal. (Baker), and Los Angeles Co., Cal. (Coquillett). Three males and seven females taken May 31 and in June.

Type.—No. 8036, U. S. National Museum.

Saropogon hyalinus, n. sp.

Very similar to *luteus* except that the mesonotum is rather densely yellowish gray pruinose and marked with three brown vittæ, and the wings are pure hyaline. Length 13 mm.

Los Angeles Co., Cal. A specimen of each sex collected by the writer.

Type.—No. 8037, U. S. National Museum.

Saropogon semiustus, n. sp.

Black, the abdomen except the first segment, and the apices of the femora, reddish yellow, the halteres light yellow, all hairs and bristles whitish; in the female the femora, tibiæ and tarsi are also reddish yellow, the antennæ yellowish brown. Body slender, head, thorax, scutellum, and coxæ densely grayish pruinose. Third joint of antennæ tapering from the middle to the tip, one and one-fourth times as long as the first two, the style very small. Scutellum bearing two bristles. Abdomen polished, sides of first segment and a spot in hind angles of segments 2 to 5, gray pruinose. Wings hyaline, the fourth posterior and anal cells open. Length 10 mm.

San Diego Co., Cal. Four males and two females collected by the writer.

Type.—No. 7960, U. S. National Museum.

Family DOLICHOPODIDÆ.**Sciapus pruinus, n. sp.**

♂.—Head and body bluish green, bases of abdominal segments 1 to 6 black, genitalia small, the terminal portion black; face bare, yellowish pruinose, front wholly white pruinose, antennæ black, the second joint bearing on its under side one very long and several short bristles, arista plain, less than one-half as long as the body, proboscis yellow, palpi black, hairs on lower two-thirds of occiput white; thorax grayish pruinose, the mesonotum very thinly so, apices of abdominal segments 3 to 6 and the whole of the seventh thinly grayish pruinose, apex of abdomen devoid of long bristles. Wings hyaline, costa not ciliate, hairs of calypteres black. Legs dark green, narrow apices of front and middle femora, the whole of their tibiæ and base of the front tarsi yellow, hind tibiæ and their tarsi black; tarsi plain, not ciliate, first two pairs of tibiæ bearing two long bristles on the inner side, the middle tibiæ also with two long bristles, other bristles of these tibiæ short, hind tibiæ bearing a few short bristles only. Knobs of the halteres whitish.

♀.—Same as the male except that the front is not pruinose and the bristles of the tibiæ are rather short.

Length 4.5 to 5 mm.

Miami, Florida. Two males and four females collected by Mrs. A. T. Slosson.

Type.—No. 7961, U. S. National Museum.

Family TACHINIDÆ.**Distichona auriceps, n. sp.**

Black, the second joint of antennæ and the palpi yellow. Front at narrowest point slightly wider than either eye, sides of front and of face

golden yellow pruinose, a row of about five bristles outside of each frontal row, the latter descends a short distance below the arista, a patch of bristly hairs on lower part of sides of face, extending from the vibrissæ half way to the lowest frontal bristle, facial ridges bristly on the lower three fourths, vibrissæ nearly on a level with the front edge of the oral margin, antennæ slightly shorter than the face, the third joint five times as long as the second, arista thickened on the basal three-fourths, the penultimate joint about six times as long as wide. Thorax grayish pruinose, mesonotum marked with four black vittæ, four pairs of postsutural dorsocentral bristles, four sternopleurals, of which the lowest is noticeably smaller than the others. Abdomen grayish pruinose and with darker reflecting spots, last three segments with marginal bristles only. Middle tibiæ bearing three bristles on the anterior outer side, pulvilli of front tarsi elongated. Wings hyaline, third vein bearing three bristles near the base, first posterior cell closed in the margin; calypteres whitish. Length 6.5 mm.

Frontera, Tabasco, Mexico, February 12. A male specimen collected by Mr. C. H. T. Townsend.

Type.—No. 7962, U. S. National Museum.

Family SARCOPHAGIDÆ.

Sarcophaga amblycoryphæ, n. sp.

Black, the fourth abdominal segment and the genitalia yellow. Head gray pruinose, on the face and lower part of sides of front grayish yellow, vertex three-fifths as wide as either eye, frontal vitta deep brown, on the upper portion nearly twice as wide as either side of the front at the same point, two pairs of orbital bristles, frontals descending almost to base of third antennal joint, antennæ three-fourths as long as the face, the third joint less than three times as long as the second, longest hairs of arista about four times as long as its greatest diameter. Body gray pruinose, abdomen with darker reflecting spots, mesonotum marked with three black vittæ, only three pairs of postsutural dorsocentral bristles, these are large and of nearly an equal length, three sternopleurals in a curved row; middle of dorsum of abdomen bearing only bristly hairs on the first two segments, the third and fourth segments each with a marginal row of stout bristles, basal segment of genitalia not cleft dorsally, bearing a marginal row of rather short bristles. Legs devoid of long hairs, hind tibiæ bearing two bristles on the anterior-inner, anterior-outer and posterior-outer sides besides those at the apex. Wings hyaline, third vein bristly two-thirds of distance from base to the small cross-vein. Calypteres whitish. Length 7 mm.

Springfield, Mass. A female specimen bred by Dr. George Dimmock from a larva that issued from a living adult of *Amblycorypha oblongifolia*.

Type.—No. 7963, U. S. National Museum.

Dr. Dimmock writes that the *Amblycorypha* was collected on August 19, 1897, by Miss Annie G. Edwards, who brought it to him the same day. It appeared to be sickly, and in the evening two larvæ issued from its abdomen and soon pupated, and the specimen of *Sarcophaga*, described above, emerged on September 11 of the same year.

Family ANTHOMYIDÆ.

Pegomya bucculenta, n. sp.

Black, the frontal triangle usually deep brown, the halteres yellow. Eyes approximated, frontal vitta at narrowest point narrower than the lowest ocellus, sides of face broad, projecting nearly the length of the third antennal joint in front of the eyes, third joint of antennæ nearly twice as long as the second, about two-thirds as wide as long, arista nearly bare, thickened on the basal fourth, epistoma only slightly produced, cheeks broader than sides of face, proboscis rather robust, labella small. Thorax grayish pruinose, not distinctly vittate, three pairs of postsutural dorsocentral bristles, sternopleurals one and two, discal pair of scutellar bristles much longer than the bristly hairs. Abdomen narrow, olive gray pruinose and with a broad black dorsal vitta, hairs of upper side of abdomen long and nearly erect, venter devoid of bristles of an unusual length, genitalia projecting nearly the length of the last abdominal segment beyond the apex of the latter. Front tibiæ bearing a single bristle, situated on the inner-posterior side, middle femora ciliate with long bristles on the basal two-thirds of the under side, their tibiæ bearing three long bristles on the outer-posterior side and two on the inner-posterior side, hind femora ciliate on nearly the entire length of the under side with rather long bristles and hairs, their tibiæ bearing two rather short bristles on the inner-anterior side, four long ones on the outer-anterior side, three long and one rather short one on the outer-posterior side, the inner-posterior side usually with two small ones; pulvilli rather short. Wings hyaline, the extreme base dark gray, costal spines very short and scarcely perceptible, auxiliary spine as long as the small cross-vein, last section of fourth vein straight. Calypteres whitish. Length 5 mm.

Mountains near Claremont, Cal. Two male specimens collected by Prof. C. F. Baker.

Type.—No. 8038, U. S. National Museum.

Family MICROPEZIDÆ.

Nerius longicornis, n. sp.

Head brown, the lower part of the front, the face and lower part of the head, yellow, two black spots along the front border of each eye near the

junction of the front and face, and a brown vitta extending from middle of hind border of each eye to the neck; antennæ brown, the second joint and base of the first joint yellow, apical slender portion of the arista white; second joint of antennæ nearly four times as long as the first; mouth parts brown. Body brownish black, grayish pruinose, mesonotum marked with three median brown vittæ, sometimes confluent, the sides and pleura with many brown dots; scutellum and abdomen with a broad median brown vitta, sides of abdomen with many brown dots. Legs brownish yellow, usually a paler ring before the apex of each femur. Wings grayish hyaline, the outer portion beyond apex of auxiliary vein tinged with brown along the costa and veins. Halteres yellow, the knobs brown. Length 8 to 9 mm.

San Diego, Tex. (E. A. Schwarz) and Brownsville, Tex. (C. Schæffer, C. H. T. Townsend); Tucson, Arizona, Feb. 8 and 10 and Dec. 30 (H. G. Hubbard); Los Angeles Co., Cal., March (D. W. Coquillett). Two males and twelve females.

Type.—No. 7781, U. S. National Museum.

Family SAPROMYZIDÆ.

Lauxania signatifrons, n. sp.

Black, the first two joints of antennæ, extreme apices of femora and the halteres, yellow, the antennal arista, tibiæ and tarsi yellowish white. Front thinly grayish pruinose, in the middle of each side a pair of elongated velvet-black spots, the outer one contiguous to the eye, the other between this one and the middle of the front, the orbital bristles situated between the two spots which form each pair; face strongly convex, polished, the orbits gray pruinose; antennæ longer than the face, narrow, of nearly an equal width, the third joint three times as long as the second, arista very long-plumose. Thorax thinly grayish pruinose, upper side of scutellum wholly velvety-black, abdomen polished. Wings yellowish gray, darkest in the marginal cell. Length 3 mm.

Brownsville, Texas. A single specimen collected by Mr. Charles Schæffer.

Type.—In museum of Brooklyn Institute of Arts and Sciences.

Sapromyza picticornis, n. sp.

Yellow, the narrow frontal vitta, four vittæ on the mesonotum, two on the pleura and two on upper side of the scutellum, brownish, an ocellar dot, the first two joints of antennæ, the arista except at base, a round spot in middle of lower part of the face, the palpi, a pair of subapical spots on

the scutellum, a transverse row of three spots on each segment of the abdomen except the first two, and a band near the bases of the hind tibiæ, black, the hairs and bristles also black; the spots on the abdomen are least distinct toward its base. Third joint of antennæ oblong, about one and one-half times as long as wide, arista long-plumose. Wings yellowish hyaline, small and hind cross-veins narrowly bordered with brown. Length 3.5 mm.

Chinandega, Nicaragua. A single specimen collected by Prof. Carl F. Baker.

Type.—No. 7964, U. S. National Museum.

I have also examined a specimen of this species collected by Mr. Charles Schæffer near Brownsville, Texas.

Family DROSOPHILIDÆ.

Drosophila ordinaria, n. sp.

Distinguished by the arrangement of the fronto-orbital bristles. Yellow, the broad hind margins of the abdominal segments, except in middle of the dorsum, brown. Front opaque, somewhat velvety, orange yellow, at the insertion of the orbital bristles polished, a few hairs on the lowest fourth; the three orbital bristles on either side in a longitudinal row, the middle one very small, the front one proclinate, the other two somewhat reclinate; the bristle next below each vibrissa less than one-fifth as long as the latter. Mesonotum and abdomen polished. Wings grayish hyaline, unmarked, last section of fifth vein less than half as long as the penultimate section of the fourth. Length 2.5 mm.

White Mountains, N. H. Three specimens collected by H. K. Morrison.

Type.—No. 7965, U. S. National Museum.

Family GEOMYZIDÆ.

Sinophthalmus, n. gen.

Near *Anthomyza*, but the face strongly carinate in the middle, etc. Head about as wide as high, slightly longer at the vibrissæ than at base of antennæ, front narrowing anteriorly, at vertex nearly twice as wide as either eye, postvertical bristles very small, two pairs of vertical bristles, one of ocellar, three pairs of frontal bristles, arranged in two longitudinal rows on the upper half of the front, the lowest pair proclinate, the others reclinate; antennæ two-thirds as long as the face, the second joint furnished with a rather long bristle on the upper side, the third suborbicular but

somewhat truncated at the base, slightly longer than the second, arista almost bare, the penultimate joint wider than long; face with a high median carina which extends from the lower edge of the front to three-fourths of the length of the face; vibrissæ well-developed, inserted distinctly above the level of the middle of the lower edge of the face, clypeus strongly projecting, eyes bare, distinctly higher than long, five times as high as width of cheek, occiput strongly concave on the upper half where it projects very little beyond the eyes, on the lower half it projects strongly behind the eyes. Thorax bearing two pairs each of acrostichal, dorso-central, supra-alar, notopleural and sternopleural bristles, one humeral, scutellum bearing four marginal bristles. Legs robust, front femora ciliate with a few bristles on the under side, other femora and all tibiæ devoid of bristles. Auxiliary vein distinct on slightly over its basal half, the remainder obsolete, the anal and both basal cells complete, hind cross-vein present, anal angle well-developed.

Type: The following species:

Sinophthalmus pictus, n. sp.

Head yellow, an ocellar dot, two dots on each cheek, the sides of the clypeus and the occiput except the lower part and middle of the upper, black; antennæ and palpi yellow, proboscis largely brown, robust, and with large labella. Thorax black, grayish pruinose and marked with many brown dots and a few brown spots; scutellum gray pruinose, a pair of brown spots near the base, a black or brown spot occupies most of the apical half except the sides and extreme apex, also a black dot at base of each bristle comprising the first pair. Abdomen opaque black, the first two segments except a spot toward each side of the second, the narrow hind borders of the next two, and the front ends of the following two, yellow and covered with a whitish pruinosity. Legs black, the knees, two bands on each tibia, and the tarsi except their apices, yellow. Wings hyaline, pale grayish along the costa, a brown cloud on the hind and the small cross-vein, a brown dot near middle of last section of the fourth vein. Length 3 to 3.5 mm.

Mountains near Claremont, Cal. (C. F. Baker); Yosemite, Cal., September 3. Twelve specimens. Reported as being annoying to the eyes of visitors to the locality last mentioned.

Type.—No. 8039, U. S. National Museum.

Family AGROMYZIDÆ.

Agromyza tæniola, n. sp.

Near *magnicornis*, but the third joint of the antennæ is very small, the mesonotum not pruinose, etc. Black, the proboscis, narrow lateral mar-

gins of the mesonotum, narrow hind margins of the abdominal segments, the hypopygium and halteres, yellow, second joint of antennæ and the knees narrowly yellowish brown. Apparently three pairs of dorsocentral bristles, the anterior pair situated slightly behind the suture. Abdomen polished. Wings hyaline, veins brown, strong, small cross-vein near middle of the discal cell, last two sections of fifth vein subequal in length, costal vein prolonged beyond the end of the fourth. Length 2 mm.

Mountains near Claremont, Cal. A male specimen collected by Prof. C. F. Baker.

Type.—No. 8040, U. S. National Museum.

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PROCEEDINGS
OF THE
ENTOMOLOGICAL SOCIETY
OF WASHINGTON.

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The 188th regular meeting was held at the Sængerbund Hall, 314 C street, N.W. In the absence of the President and both Vice-Presidents, Dr. Ashmead was called to the chair. Present: Messrs. Benton, Currie, Knab, Kotinsky, Patten and Ulke.

It was moved and seconded that two delegates be appointed to represent the Society at the International Geographic Congress to convene in Washington in September.*

Mr. C. L. Pollard was transferred from the list of active members to that of corresponding members, to date from January 1, 1904.

Mr. Knab, for Mr. Caudell, exhibited four specimens, two ♂♂ and two ♀♀, of the grasshopper *Rhadinotatum brevipenne* Thomas, showing the color variation to which this species is subject. The specimens were collected at Macon, Georgia, by Mr. Kotinsky. One of the ♀♀ is wholly brown, the other has the posterior femora and the sides of the elytra, prothorax and head green, while both ♂♂ are grass-green on the dorsal surface of the head, prothorax and elytra. The species has not before been recorded outside of Florida, although mentioned in Thomas' paper on "Insects Collected West of the 100th Meri-

* Dr. Theo. Gill and Mr. Frank Benton were subsequently appointed by the President.

dian," to note that it should be removed to another genus from *Tryxalis*—the one in which it was described. In characterizing the genus *Rhadinotatum*, McNeill states that the posterior tibia has about 25 spines on the outer margin, and this has since been used as a synoptic character by Scudder and Bruner. Mr. Caudell had examined fifteen specimens, including the types, and found the usual number to be about 18, the greatest number found being only 21.

Dr. Ashmead remarked that *Rhadinotatum* belongs to a group which is less abundant in the North than in the South. He had found similar forms in Florida and always in low-lying grassy land. Mr. Kotinsky stated that his specimens were likewise found in low grassy land. He said that the insects depended upon protective coloration for concealment, and if one observed carefully the spot where they alighted on the grass blades they could readily be picked up with the fingers.

—Mr. Knab further noted for Mr. Caudell that Dr. Howard had collected a ♂ of *Trimerotropis filosa* McNeill, in Mexico. The species was described from California and this is the first record of it since its description.

—Dr. Ashmead reported the receipt of two more sendings of Philippine Hymenoptera from Manila, one from Father W. A. Stanton and the other from Father Robert Brown. The new forms contained in these sendings will increase the list of species additional to those already recorded as occurring in the Philippines to 43.* He mentioned several of these—among them a little Entedonid belonging to the genus *Closterocerus* of Westwood. Mr. Ashmead said he considered it remarkable that Father Stanton had found so many species, and new ones at that, since all his collections had been made in the gardens of the observatory in Manila. It indicated, however, what a vast number of undiscovered species there must be in the Philippine Islands and what a wealth of material might be secured from a thorough collecting exploration of the surrounding country.

—Mr. Kotinsky stated that during the summer of 1903 six or eight colonies of the Asiatic ladybird (*Chilocorus similis* Rossi) were introduced by the Department of Agriculture into various

* In Journ. N. Y. Ent. Soc., XII, No. 1, pp. 1-22, March, 1904.

parts of Georgia. Upon going again to Georgia this past spring he had visited four or five of these colonies, and in only two had a favorable increase in the number of individuals been made. A colony established at Marshallville contained a year ago 40,000 beetles, but this spring there were none to be found. This Mr. Kotinsky attributed to the fact that the part of the orchard containing the beetles had been sprayed with lime, salt, and sulphur wash, and that this had killed them. A colony had accidentally established itself in an adjoining orchard, but owing to improper care, it was weak in numbers this spring.

The immense colony of what afterward turned out to be *C. bivulnerus*, found in a section of plum trees in this same orchard feeding upon *Pulvinaria amygdali* Cockerell, with which these trees were badly infested, was at first mistaken for the imported beetle, owing to the large numbers of pupæ found congregated together.

Taking it all in all, it may be said that owing to improper care of the various colonies established in Georgia—due to ignorance of the habits of the beetle on the part of the orchard managers—none of the colonies was in a very thriving condition. Mr. Kotinsky said he suggested to these managers to collect and transfer a colony of the beetles, each summer, to a section of the orchard they did not expect to spray the following year—since he was informed that no orchard is entirely sprayed each year.

Mr. Kotinsky ventured the supposition that possibly the colony on plum trees, referred to above, might be a cross of the two species (*Chilocorus bivulnerus* and *C. similis*), retaining the structural characters of *bivulnerus* and the prolific breeding of *similis*.

In conclusion, he observed that in shipping the ladybirds alive precautions must be taken that there is not, in the shipping cases, sufficient ventilation to cause a drying up of the enclosed twigs, since these beetles suffer much more from lack of moisture than from lack of food. All possibility of the rattling of the enclosed twigs must be avoided, also, and this, it seems, can only be accomplished by tacking the twigs to the box in which they are packed, for some evaporation will take place under all circumstances and this will cause the twigs to contract so as to become loosened.

Referring to Mr. Kotinsky's suggestion that the colony of beetles found on plum trees might be a cross between *Chilocorus bivulnerus* and *C. similis*, Mr. Ulke stated that there has yet been no authentic record of hybridization or crossing among beetles. Dr. Ashmead said he had found *Chilocorus bivulnerus* extremely abundant on Lecanium on orange in Florida, and also on oak, and that he had observed strings of pupæ on the Spanish moss, showing that this species is sometimes a prolific breeder and has the habit of congregating in numbers for pupation.

—Mr. Benton exhibited a beehive to show the ingenious method by which certain varieties of honey bees protect their hives from the entrance of insect enemies. These defenses consist of a row of stout, columnar pillars, made of gnawings of wax mixed with propolis and built in the hive entrance. They were made by some bees recently imported from the Island of Cyprus. Mr. Benton pointed out that all Oriental races of honey bees, in contradistinction to those of Europe, construct these defenses, which serve to prevent the entrance of the death's-head moth (*Sphinx atropos*) and the Oriental wasp (*Vespa orientalis*), two insects which are injurious to honey bees in the Orient, the former by occasionally robbing them of their honey and the latter by preying upon the bees themselves. When imported into this country, where they are free from these two insect enemies, the bees keep up the habit of building these defenses for two or three seasons only, and then abandon it. The Carniolan, Austrian, and German bees do not make the defenses, either in this country or in their home in Europe. Mr. Benton referred, in this connection, to the curious defenses made by the stingless honey bees (*Melipona* and *Trigona*) and which formed the subject of a paper presented by him some years ago before the Society.* In that paper he had alluded also to the entrance defenses made by certain varieties of *Apis mellifera*.

—Mr. Currie read extracts from letters received from Mr. Schwarz at Cayamas, Cuba, and Mr. Barber, at Brownsville, Texas, describing entomological conditions in those localities. Mr. Schwarz mentioned in his letter having secured at Cardenas,

* Proc. Ent. Soc., Wash., III, pp. 18-23, March 8, 1894 (paper read March 9, 1893).

through the kindness of a friend of Mr. Eduardo Ferrer, a specimen of the genuine Jegen (*Æcacta furens* Poey), the Chironomid which is such a pest at that locality, and which has much the same habits as our sandflies in the United States. Mr. Schwarz stated in his letter that certain Cuban birds feed upon the cotton boll weevil in Cuba and are instrumental in diminishing its numbers.

—The Secretary presented for Dr. Dyar the following paper:

DESCRIPTIONS OF NEW FORMS OF THE GENUS *ILLICE* WALKER.

By HARRISON G. DYAR.

The number of species and varieties in this genus is more numerous than has been heretofore conceded. The following table will separate the forms at present known to me:

Anal angle of fore wing produced, red-tipped.....*schwarziorum* Dyar.
Anal angle of fore wing not produced, not red-tipped.

Fore wing smooth gray; hind wing bright pink (rarely yellow).

Fore wing with a yellow band, rarely divided or lost, but if so the costal or marginal remnants are angular.

Disk of thorax gray.

Head and collar yellow.

Fore wings gray, the yellow band moderate or narrow.

Band of fore wings moderate, *unifascia* Grote & Robinson.

Band of fore wings narrow or broken,

var. tenuifascia Harvey.

Fore wings blackish gray; band very broad,

var. kentuckiensis Dyar.

Head and collar pink.....*var. perrosea* Dyar.

Head gray.....*var. barnesii* Dyar.

Disk of thorax and head yellow.....*angelus* Dyar.

Fore wings with a rounded yellow dorsal spot.

This spot joined to base by a ray along dorsal margin.

Fore wings with a costal yellow stripe.....*injecta* Dyar.

Fore wings with no costal yellow stripe.

Head pink.....*var. gamma* Dyar.

Head gray.....*striata* Ottolengui.

No ray along the dorsal margin nor above it....*plumbea* Stretch.

A ray from the spot to base above the dorsal margin,

subjecta Walker.

Fore wings gray irrorated with whitish, not smooth and slaty.

Head gray on vertex.

Fore wing with small whitish dorsal spot near tornus,
dorsimacula Dyar.

Fore wing with a broken band forming a large angular spot detached from margin.....*liberomacula* Dyar.

Head white on vertex.

Band of fore wings not attaining costa.....*nexa* Boisduval.

This band attaining costa.

The band soiled whitish.....*faustinula* Boisduval.

The band pale gray.....*var. fusca* Stretch.

***Illice unifascia* Grote & Robinson.**

Variety *kentuckiensis*, n. var.

Vertex of head, collar and patagia dark yellow, disk of thorax gray, abdomen pink. Fore wings dark blackish leaden gray; a very broad transverse band of yellow occupying fully one-third of the wing, broadly joined to base on inner margin. Hind wing pink with narrow outer gray border. Size as usual.

One specimen, Kentucky (Geo. Franck).

Type.—No. 7966, U. S. National Museum.

Variety *perrosea*, n. var.

Vertex of head, collar, thorax, except center of disk, and abdomen pink. Fore wings smooth slaty gray; a straight, slightly oblique rather narrow pink band parallel to the outer margin joined to base along inner margin, rarely obsolete. Hind wings pink with a rather broad outer gray border. Size large.

Five specimens, Los Angeles, California (D. W. Coquillett).

Type.—No. 7967, U. S. National Museum.

Variety *barnesii*, n. var.

Head, collar and thorax gray, except the inner edge of patagia, and sometimes base of collar, which is yellow; band of fore wings yellow, narrow, usually broken, upright, not parallel to outer margin, narrowly joined to base along inner margin. Hind wing pink, pale orange or yellow, with outer border broad at apex. Size large.

Seven specimens, Glenwood Springs, Colorado (Wm. Barnes).

Type.—No. 7968, U. S. National Museum.

Two other specimens from Texas agree in having a gray head, but the collar is yellow and they are of the usual size.

***Illice angelus*, n. sp.**

Head, collar and thorax yellow, abdomen pink. Fore wings elongate, light slaty gray, shining; band yellow, slightly oblique, even, broad, joined to base along inner margin. Hind wing pink with gray border toward apex. Expanse 23 to 28 mm.

Seven specimens, Bright Angel, Arizona (H. S. Barber).

Type.—No. 7969, U. S. National Museum.

***Illice injecta*, n. sp.**

Head and collar yellow or pink, the disk of thorax diffusely gray shaded or without gray. Fore wings slaty gray; a broad costal yellow stripe, diffused or spreading below; a rounded angular spot before tornus joined to base by a stripe on inner margin. Hind wings pink with a gray spot at apex. Expanse 18 to 22 mm.

Seven specimens, Kirkwood, Missouri (Mary Murtfeldt); Tryon, North Carolina (W. F. Fiske); Plummer's Island, Maryland (E. A. Schwarz); Badger, Wisconsin (Barlow).

Type.—No. 7970, U. S. National Museum.

This is Hampson's "*Illice unifascia* ab. 5." *

Variety *gamma*, n. var.

The yellow costal stripe is lacking and the border of hind wings is extended.

One specimen (Meske collection).

Type.—No. 7971, U. S. National Museum.

***Illice dorsimacula*, n. sp.**

Head, thorax and fore wings sandy gray, mixed of cinereous and whitish scales; a small, sordid white spot on dorsal margin before tornus and trace of a minute one above it near middle of wing. Hind wing sordid rosy with gray apical margin. Expanse 20 mm.

One specimen, Los Angeles, California (D. W. Coquillett).

Type.—No. 7972, U. S. National Museum.

***Illice liberomacula*, n. sp.**

Head and thorax sandy gray, collar in part whitish. Fore wings gray; an irregularly lunate, sordid silvery white mark above inner margin below end of cell, joined to costa by a more or less complete row of small dots. Hind wing sordid ochraceous, costa and apex more or less broadly gray. Expanse 17 to 19 mm.

Three specimens, Los Angeles, California (D. W. Coquillett).

Type.—No. 7973, U. S. National Museum.

—The following paper by Mr. Coquillett was read by the Secretary :

* Cat. Lep. Phal. B. M., II, p. 366, 1900.

NOTES ON THE SYRPHID FLY *PIPIZA RADICUM* WALSH AND RILEY.

By D. W. COQUILLETT.

This species was originally described from a female specimen bred May 23, 1868, by B. D. Walsh, from a larva found feeding upon *Schizoneura lanigera* in November, 1867, at Duquoin, Illinois.* In his "Bibliography of the writings of Walsh and Riley,"† Mr. Samuel Henshaw indicated that this specimen is in Washington, D. C., but this was evidently an error on the part of his informant, since no trace of it can be found either in the National Museum or among the insects in the collection of the U. S. Department of Agriculture. As this specimen was bred by Walsh it in all probability formed a part of his collection which was destroyed by fire in Chicago.

In the National Museum collection is a female specimen of a *Pipiza*, labeled as having also been bred from a larva found preying upon *Schizoneura lanigera*, presumably at Washington, D. C., the date of emerging being given as April 6, 1879; it bears the note-book number 57°, but the particular note-book which refers to it does not at present appear to be in the possession of either the Department of Agriculture or of the National Museum. Judging by the data attached to this specimen, it is one of those referred to by Prof. J. H. Comstock in his annual report as Government entomologist for the year 1879, where the species is called "The root louse syrphus fly, presumably the *Pipiza radicum* of Walsh and Riley."‡ The present specimen agrees well with the original description of this species, and, having similar habits, is without much doubt identical with it.

Osten Sacken wrongly credited this species to Riley, and made the statement that it is "apparently the same as *femoralis* Loew."§ Why it was so considered is not apparent, since there is no mention in the original description of the yellow cross-band on the second abdominal segment, which is such a conspicuous feature in the last-named species. Dr. Williston placed it, with a query, as a synonym of *femoralis*|| without making any comment thereon; he also wrongly credited it to Riley.

A recent comparison of the original description of *radicum* with those of the other species occurring in our fauna showed a

* American Ent., I, p. 83, January, 1869.

† Page 374.

‡ Report Comm. Agric. for 1879, p. 259.

§ Catalogue Diptera N. Am., p. 120, 1878.

|| Synopsis N. Amer. Syrphidæ, p. 26, 1886.

close agreement with only one of them, that of *pistica* Williston, and the two specimens upon which the latter is based, which are now in the National Museum, agree well with this description as also with the specimen referred to above as having been bred from *Schizoneura lanigera*. Thus the synonymy of *pistica* with *radicum* is quite certain, and the species should, therefore, be known henceforth as *Pipiza radicum* Walsh and Riley, which is the older name.

—The following paper by Mr. Banks was read by title :

**A LIST OF NEUROPTEROID INSECTS, EXCLUSIVE OF ODO-
NATA, FROM THE VICINITY OF WASHINGTON, D. C.**

By NATHAN BANKS.

The vicinity of Washington is well suited to many Neuropteroid insects, but the Trichoptera are not nearly as abundant as in the mountainous regions to the north. The Psocidæ are particularly numerous here, both in species, and in individuals.

This fauna has, of course, not been fully explored, but such a considerable showing is made in the following list that it is thought desirable to publish in the hope of stimulating others to collect in this group. In all, 174 species are recorded, distributed as follows: Archiptera 73, Neuroptera 47, Trichoptera 54. The leading family, in point of numbers, is the Psocidæ, with 31 species; two families, the Termitidæ and Ascalaphidæ, are each represented by but one species.

In Virginia a few southern forms are found, and in the Potomac valley there is a southward extension of many northern species. As a whole, however, the fauna is like that of the eastern coast States.

Compared with the Neuropteroid fauna of the arid southwest there are very radical differences. I do not think there are more than a half a dozen species common to this list and the lists of Arizona and New Mexico which I have recently published.

The types of the new species are in the author's collection.

Order ARCHIPTERA.

Suborder ISOPTERA.

Family TERMITIDÆ.

***Termes flavipes* Kollar.**

Common throughout the region. There is probably another species with us, but it is not certain which form is the true *T. flavipes*.

Suborder CORRODENTIA.

Family PSOCIDÆ.

Psocus virginianus Banks.

Inhabits the crevices of old fence-rails. Falls Church, Va., from July to September.

Psocus sparsus Hagen.

From Falls Church, Va., and Plummer's Island, Md., July to October.

Psocus lugens Hagen.

From Falls Church and Glencarlyn, Va., in August.

Psocus mœstus Hagen.

Several from Falls Church, Va., in June.

Psocus atratus Aaron.

Several from trunk of tulip tree, Falls Church, Va., in July.

Psocus trifasciatus Provancher.

P. speciosus Aaron.

One from Falls Church, Va., in September.

Psocus hageni, n. n.

P. contaminatus Hagen, 1861 (not Stephens, 1836).

Rather common on tree-trunks, from July to September.

Psocus striatus Hagen.

On old fences and old rails, often with *P. purus*. Falls Church, Va., from July to September.

Psocus purus Walsh.

On old fences and old rails. Falls Church, Va., in September.

Psocus leidyi Aaron.

On trunks of living trees; also on lichens on rocks, Falls Church, Va., and Washington, from July to September. One of our most common species.

Psocus variabilis Aaron.

Very common on maple-tree trunks, Washington, D. C., and Falls Church, Va., in July and August.

Psocus pollutus Walsh.

Two from Falls Church, Va., in October.

Psocus perplexus Walsh.

* One specimen, probably this species, from Falls Church, Va., 25th June.

Psocus slossonæ Banks.

One from Falls Church, Va., 12th July; one from Glencarlyn, Va., July, and one from Plummer's Island, Md., 16th July.

Psocus bisignatus, n. sp.

Head black, nasus with eight pale lines, two prominent pale spots on vertex, and oblique pale marks downwards from the ocelli; clypeus wholly black; antennæ pale brown, basal joints darker. Mesothorax black, a median spot behind, and two dots on each side behind, yellowish; metathorax black, with a median pale spot; abdomen black, the segments narrowly margined with yellowish; legs yellowish brown, darker on tips of femora and tibiæ. Wings hyaline, an incomplete black band just before cell, a small black spot at base of the pterostigma, and a larger spot in apex, extending outward; venation mostly dark, base of the fork of sector, most of vein closing cell below, part of that on apical side, and the vein around pterostigma (except near angle) pale yellowish; hind wings hyaline, venation brown. Vertex convex; antennæ shorter than wings, and with very short fine hair; discal cell very plainly 5-sided, the apical side curved inward; pterostigma with prominent angle, which is prolonged into a distinct spur. Length, 3.2 mm. (Genitalia, Plate II, Fig. 10.)

Two specimens from Falls Church, Va., 25th June,

Psocus elegans, n. sp.

Head pale, almost white, nasus wholly dark brown, with a brown extension to each eye; clypeus brown; a few dark dots behind each eye; antennæ pale, basal joints white. Mesothorax dark brown, margined with pale behind; metathorax paler brown; abdomen pale; legs pale. Fore wings whitish-hyaline, a more or less complete black band starting from base of pterostigma and extending obliquely backward; a black spot in apex of pterostigma extending outside, base of pterostigma faintly clouded, and black spots in the bases of the four posterior cells; sometimes one or two other small black spots in apical part of wing; hind wings hyaline; venation pale, except where touched by the black marks. Head narrow below; vertex deeply emarginate; eyes very prominent; antennæ shorter than wings, sparsely clothed with rather long hairs; nasus hairy; discal cell 4-sided or almost so, lower side fully two-thirds length of upper, outer side but little longer than upper; pterostigma rounded behind. Length 3 mm.

Three specimens from Falls Church, Va., 12th and 17th July, and 5th August; one from bark of whitewood, and two from bark of chestnut trees.

Cerastipsocus nervosus Burmeister.

In colonies on trunks of trees, Falls Church, Va., August and September.

Polypsocus corruptus Hagen.

Abundant on the leaves of trees from July to September,

Peripsocus madidus Hagen.

On the ground, among dead leaves, etc., at Falls Church, Va., and on rocks at Glencarlyn, Va., September and October.

Peripsocus permadidus Walsh.

A few only, found with the preceding.

Ptilopsocus annulicornis Banks.

One specimen on chestnut bark, 8th June, Falls Church, Va.

Elipsocus canadensis Provancher.

One specimen from Falls Church, Va., 16th July.

Cæcilius aurantiacus Hagen.

Common on the leaves of various trees from July to September.

Cæcilius pinicola Banks.

Falls Church and Glencarlyn, Va., July to September. This species lives in pine trees.

Cæcilius rufus Walsh.

Falls Church, Va., in dead leaves, September and October.

Pterodela pedicularia Linné.

Abundant on fresh wood, in old furniture, about houses, on wood piles, etc., from July to October.

Amphientomum hageni Packard.

On bark of living and dead trees, old rails, etc., Falls Church, Va., and Washington, D. C., from July to October.

Troctes divinatoria Fabricius.

About houses, common everywhere.

Troctes bicolor Banks.

Running over dry boards, Falls Church, Va., in June.

Troctes niger Banks.

Beneath dead and decaying logs in woods at Falls Church, Va., in June.

Dorypteryx pallida Aaron.

Found about old books and desks, from May to October. This is our only jumping species.

Suborder PLECOPTERA.

Family PERLIDÆ.

Pteronarcys regalis Newman.

One male, 2d May, Falls Church, Va.; another from Plummer's Island, Md., 20th April.

Acroneuria arenosa Pictet.

A. arida Hagen.

One of our most common species, found in June and July.

***Perla fumosa* Banks.**

One pair, Washington, in July at light.

***Perla xanthenes* Newman.**

Washington, at light, 4th July.

***Perla postica* Walker.**

Falls Church, Va., several specimens collected on the 29th of April.

***Perla americana* Banks.**

Falls Church, Va., several specimens collected in June; also taken at Plummer's Island, Md., in May.

***Perla annulipes* Hagen.**

Described from Washington, but I have not taken it here.

***Perla tristis* Hagen.**

Recorded from Washington by Hagen; I have not seen it from here.

***Pseudoperla occipitalis* Pictet.**

Very common. I have taken it at light, and by sweeping the vegetation near streams, in June and July.

***Perlinella placida* Hagen.**

Very commonly taken by sweeping and at light, from June until August.

***Chloroperla transmarina* Newman.**

Two from Plummer's Island, Md., 22d April (Currie).

***Isopteryx cydippe* Newman.**

Commonly collected in June and July by sweeping near streams.

***Capnia pygmæa* Burmeister.**

Common along the Potomac river in February and March.

***Capnia necydaloides* Pictet.**

Found with the preceding species.

***Tænipteryx fasciata* Burmeister.**

Along the Potomac from February to April.

***Tænipteryx frigida* Hagen.**

Several specimens from Plummer's Island, Md., 24th February (Currie).

***Tænipteryx maura* Pictet.**

Recorded by Hagen, but not seen here by the writer.

***Nemoura venosa* Banks.**

A few specimens at light, Washington, D. C., and Falls Church, Va., in June.

Nemoura completa Walker.

Taniopteryx similis Hagen.

Hagen's type was from Washington, in May, but I have not seen the species here.

Leuctra tenuis Pictet.

Recorded by Hagen. There are apparently two species here, but whether either is Pictet's is not yet certain to me.

Suborder ANISOPTERA.

Family EPHEMERIDÆ.

Polymitarcys alba Say.

Sometimes to be found in great numbers at lights all through the city, in July and August.

Hexagenia bilineata Say.

Our most common mayfly, especially abundant in the latter part of June and early in July, but found all through the summer.

Hexagenia limbata Pictet.

Much less common than the preceding species. Found in July.

Leptophlebia cupida Say.

Common early in Spring from March to May.

Ephemerella excrucians Walsh.

Found in Washington at light.

Habrophlebia americana Banks.

One specimen from Washington, 21st July.

Siphylurus aridus Say.

One from Falls Church, Va., 10th August.

Bætis vicina Hagen.

Plummer's Island, Md., August.

Bætis unicolor Hagen.

Described from Washington. I have not seen it from here, but from New York.

Cleon mendax Walsh.

Quite abundant in spring and fall.

Cleon sp.

Specimens of a larger species from Washington, collected in October.

Callibætis fluctuans Walsh.

Washington, D. C., and Falls Church, Va., July.

Cænis hilaris Say.

Abundant throughout the summer along the Potomac and at Falls Church, Va.

Cænis amica Hagen.

Falls Church, Va., 8th August. This is a smaller species than *C. hilaris*.

Heptagenia vicaria Walker.

A pair from Falls Church, Va., collected in May.

Heptagenia verticis Say.

A subimago from Washington, taken at light.

Heptagenia terminata Walsh.

Not as common as the preceding species.

Heptagenia pulchella Walsh.

Quite abundant; High Island and Plummer's Island, Potomac river.

Heptagenia canadensis Walker.

H. maculipennis Walsh.

Falls Church, Va., 11th June; Plummer's Island, Md., July and August.

Heptagenia flaveola Pictet.

This is our common species of the genus. It is close to *H. interpunctata* Say, but is smaller and lacks the dark dorsal abdominal stripe.

Heptagenia simplex Walsh.

Three specimens from Plummer's Island, Md., 29th August.

Order NEUROPTERA.**Suborder MEGALOPTERA.****Family SIALIDÆ.****Sialis infumata** Newman.

From the 10th of May on through June, near small streams.

Chauliodes fasciatus Walker.

Along the Potomac in August.

Chauliodes serricornis Say.

Upper part of the Potomac river; High Island and Plummer's Island; Md., July; Glencarlyn, Va., 18th June.

Chauliodes pectinicornis Linné.

One from Washington, at light.

Chauliodes rastricornis Rambur.

Washington, at light, July.

Corydalis cornutus Linné.

Moderately common along the Potomac, in July and August.

Suborder STEGOPTERA.**Family CHRYSOPIDÆ.****Allochrysa virginica** Fitch.

From oak trees near the National Zoological Park, in July.

Chrysopa oculata Say.

Very common. The first adult is to be seen in the latter part of May, usually in tall grass or shrubbery, less commonly on trees.

Chrysopa chlorophana Burmeister.

From Hyattsville, Md. This species is of more northern occurrence.

Chrysopa ypsilon Fitch.

Hagen records a specimen from Washington. I have not seen it south of New Jersey.

Chrysopa albicornis Fitch.

A few from Falls Church, Va.

Chrysopa nigricornis Burmeister.

Moderately common about the District. It comes to light.

Chrysopa columbiana Banks.

One specimen, the type, from Washington.

Chrysopa lineaticornis Fitch.

Not common. It has been taken at Bay Ridge, Md., in July, and at Plummer's Island, Md.

Chrysopa rufilabris Burmeister.

Very common in meadows and shrubbery, and on trees, from June till October.

Chrysopa interrupta Schneider.

A few from trees, Washington, D. C., July.

Chrysopa quadripunctata Burmeister.

Fairly common, usually about oak trees, from June till October.

Chrysopa medialis Banks.

A few specimens, the types, from High Island, Md., collected in September.

Chrysopa harrisii Fitch.

Rather common in pine trees, from July to September.

Meleoma signoretti Fitch.

High Island and Plummer's Island, Md., in August and September.

Family HEMEROBIIDÆ.

Polystæchotes punctatus Fabricius.

Not common. Taken at light at Washington, in August.

Lomamyia flavicornis Walker.

One specimen, Falls Church, Va., 1st July.

Sisyræa vicaria Walker.

Several specimens, taken along the canal near High Island, Md., in June.

Climacia areolaris Hagen.

One from Plummer's Island, Md., collected in August.

Micromus posticus Walker.

Very common from July to September in shrubbery, and larvæ on trees.

Micromus angustus Hagen.

Falls Church, Va., June, on ground among grass tufts.

Symphærobis amiculus Fitch.

Washington, D. C., Falls Church, Va., and Plummer's Island, Md., in June and July. Not very common.

Boriomyia fidelis Banks.

Taken near Glencarlyn, Va., 23d June, in pine woods.

Boriomyia speciosus Banks.

The type is from Plummer's Island, Md., 9th Sept.

Hemerobius humuli Linn.

H. castaneæ Fitch.

Abundant from May till August.

Hemerobius stigmaterus Fitch.

Moderately common, in early spring and again in fall.

Family CONIOPTERYGIDÆ.

Coniopteryx vicina Hagen.

Common in May, June and July, on trees and shrubs.

Aleuronella westwoodi Fitch.

Moderately common in early summer, on trees.

Family MYRMELEONIDÆ.

Dendroleon obsoletus Say.

Washington, D. C., and Plummer's Island, Md., at light, from July to September.

Brachynemurus abdominalis.

Falls Church, Va., in old meadow, in July.

Myrmeleon immaculatus De Geer.

Washington, D. C., at light, June; Plummer's Island, Md., September.

Family ASCALAPHIDÆ.

Ululodes quadripunctata Burmeister.

Washington, D. C., at light; a single specimen collected in July.

Suborder MECAPTERA.

Family PANORPIDÆ.

Bittacus punctiger Westwood.

Washington, D. C., taken near Rock Creek, from June to August, by sweeping.

Bittacus occidentis Walker.

In dry meadow, Falls Church, Va., and Plummer's Island, Md., in August; also at light, Travilah, Md., July (Pratt).

Bittacus stigmaterus Say.

Apparently not common. Taken on High Island, Potomac river, 14th July.

Bittacus pilicornis Westwood.

Recorded by Hine from the District of Columbia.

Bittacus strigosus Hagen.

Along the Potomac valley in June and July; moderately common.

Panorpa venosa Westwood.

Two from near Somerset Heights, Washington, D. C., 25th August.

Panorpa confusa Westwood.

Distributed throughout the region, but not common anywhere; June to September.

Panorpa rufescens Rambur.

Recorded by Hagen. It is very close to the preceding species.

Boreus brumalis Fitch.

Recorded by Hagen from Washington, and by Matthis * from the Rock Creek valley, D. C. I have not seen it from here.

*Proc. Ent. Soc. Wash., iv, No. 4, p. 364, 1901.

***Merope tuber* Newman.**

National Zoological Park (Schwarz); Plummer's Island, Md. (Schwarz, Busck, Banks, and Currie); Mt. Vernon, Va. (Cook); Falls Church, Va. (Banks); and Langdon, D. C. (Busck); July to September.

Order TRICHOPTERA.**Family PHRYGANEIDÆ.*****Phryganea interrupta* Say.**

Several have been taken on the Capitol steps at light, late in the summer.

***Phryganea vestita* Walker.**

One specimen in National Museum from Washington, May (L. O. Howard).

***Neuronia postica* Walker.**

From College Park, Md. (Sherman), and Lakeland, Md., August (Pratt).

***Neuronia semifasciata* Say.**

Plummer's Island, Md., 28th August (Schwarz and Barber).

Family LIMNEPHILIDÆ.***Goniotaulius submonilifer* Walker.**

Fairly common in May and June.

***Stenophylax scabripennis* Rambur.**

One specimen from Falls Church, Va., 18th October; one from Ashgrove, Va., October (Sherman), and one from Plummer's Island, Md., 8th September (Barber).

***Stenophylax punctatissimus* Walker.**

Several from Lakeland, Md., September (Pratt).

***Platyphylax difficilis* Walker.**

Specimens from Falls Church, Va., in September and October.

***Platyphylax subfasciata* Say.**

Specimens from High Island, Md., 28th September.

***Neophylax concinnus* McLachlan.**

One from Plummer's Island, Md., 24th September (Barber and Schwarz).

Family RHYACOPHILIDÆ.***Chimarra aterrima* Hagen.**

Abundant all through the summer. I have a smaller, shorter-winged form from Hyattsville, Md., 4th July.

***Chimarra socia* Hagen.**

Three from Washington, taken at electric light.

Family SERICOSTOMATIDÆ.

Helicopsyche annulicornis, n. sp.

Basal joint of antennæ nearly black, beyond pale, annulate with brown, darker toward tip; legs pale, coxæ and femora mostly brown. Wings dusky, with golden and black hair; fringe blackish; abdomen brown, black at tips. Wings rather elongate, venation as typical of genus, the veinlet from forking of the median running obliquely backward to cubitus. Spurs, 1-2-4. Length 6.5 mm.

Plummer's Island, Md., 28th August.

Differs from *H. borealis* in annulate antennæ, longer wings, and larger size.

Helicopsyche borealis Hagen.

Several from Falls Church and Glencarlyn, Va., and Plummer's Island, Md., July to September.

Lepidostoma togatum Hagen.

Common along the Potomac river from July to September.

Notidobia americana Banks.

One from Falls Church, Va., June.

Brachycentrus incanus Hagen.

Along the Potomac river in early spring—March and April.

Family LEPTOCERIDÆ.

Molanna cinerea Hagen.

Several specimens from Plummer's Island, Md., 16th and 20th May (Currie).

Mystacides punctata Banks.

Several from Washington, D. C., also Plummer's Island, Md., 28th August.

Leptocerus mentiens Walker.

Common along the Potomac river, in June and July.

Leptocerus maculatus Banks.

Washington, D. C., at light.

Leptocerus transversus Hagen.

Common in May, June and July.

Leptocerus flavus, n. sp.

Palpi yellow, more brownish toward apex; head clothed with white hair; basal joint of antennæ yellowish, beyond black, the basal part of segments snow-white, except those near tip; thorax yellowish, with white hair. Abdomen in female green, in male yellowish; fore wings uniformly clothed with yellow hair, fringe yellow, all veins pale yellowish; hind wings nearly hyaline, with pale gray fringe; legs pale yellowish. Length ♂ 7 mm., ♀ 6 mm.

Specimens from Washington, D. C., and Falls Church, Va., at lights.

Readily known by small size and uniformly yellow wings.

Leptocella exquisita Walker.

Common from June to August. This species is variable in size.

Leptocella uwarowii Kolenati.

Not as common as the preceding.

Leptocella albida Walker.

Less common than others, July.

Triænodes ignita Walker.

Very abundant all summer.

Æcetina avara Banks.

Quite common along the Potomac river, in June and September.

Æcetina parvula Banks.

Moderately common, at light, Washington, D. C., and Falls Church, Va., July.

Æcetina guttata Banks.

Three specimens from Plummer's Island, Md., July; three in National collection, 4th and 17th July, and 25th August.

Æcetina incerta Walker.

Very abundant, June to September.

Æcetina fumosa Banks.

Quite common, June to August, Washington, D. C., High Island and Plummer's Island, Md.

Æcetina pavidia Hagen.

Several specimens from Plummer's Island, Md., August.

Æcetina flaveolata Hagen.

A few from Falls Church, Va., at light, July and August. Described from Washington.

Family HYDROPSY HIDÆ.

Macronema zebratum Hagen.

Common along the Potomac, in July and August.

Macronema transversa Walker.

From Cabin John Bridge, Md., 30th May.

Polycentropus robusta Walker.

Washington, D. C., at light, June and July.

Polycentropus confusus Hagen.

Along the Potomac river, May to September.

***Polycentropus vestitus* Hagen.**

Common in June and July.

***Polycentropus lucidus* Hagen.**

Along the Potomac river, from June to September.

***Hydropsyche scalaris* Hagen.**

Several from Washington, D. C., Falls Church, Va., and Plummer's Island, Md., all taken during July.

***Hydropsyche alternans* Walker.**

Very abundant from July to September.

***Hydropsyche speciosa*, n. sp.**

Head brown; antennæ pale yellow; thorax almost black; abdomen dark yellow-brown; legs pale yellowish. Wings dark brown, with several large white patches as follows: One at base not reaching costal margin, a nearly complete oblique band before middle, two triangular spots beyond middle, one on front, the other on hind margin, their apices nearly touching, a spot on costa beyond the pterostigma, and a few small spots along apical margin; hind wings blackish. Length 5 mm.

Many specimens from Plummer's Island, Md., 28th August.

***Hydropsyche phalerata* Hagen.**

Quite common from June to September.

***Hydropsyche sordida* Hagen.**

Several from Falls Church, Va., July.

***Hydropsyche analis* Banks.**

From Falls Church, Va., and Plummer's Island, Md., July and August.

***Philopotamus* sp.**

One female from Glencarlyn, Va., 12th August. It has very short wings, and appears to be new.

***Cyrnus pallidus*, n. sp.**

Pale yellowish throughout; wings sparsely clothed with yellow and gray hair, fringe gray; antennæ paler than body, plainly crenate within for entire length; vertex swollen; mesothorax with a central depression containing two approximate tubercles. Wings of usual shape and venation (one specimen lacks a fork to upper branch of thyridium [fork 3]); the forks 3 and 4 are shorter than in *C. flavidus*, and the wing a little more slender; the membrane shows only one pale spot, that on the fork of thyridium, near middle of wing. Legs slender, spurs 3-4-4. Length 5 mm.

Specimens from Washington, D. C., and High Island, Md., 17th June; also Plummer's Island, Md., 19th August (Barber).

This is the first record of this genus in our country.

Family HYDROPTILIDÆ.

Protoptila, n. gen.

Spurs 0-4-4. Last joint of maxillary palpus (Plate II, Fig. 13) simple. Fore wings rather slender and nearly acute at tip, without erect hair, except a few on base, fringe moderately long; hind wing slender, costal margin before middle strongly excised, fringe very broad behind. Ocelli distinct; antennæ moderately long, not very heavy; middle and hind tibiæ heavily fringed behind.

Type: Beræa? maculata Hagen.

I place this genus in the Hydroptilidæ although there are few erect hairs and there are four spurs on middle tibiæ; yet the structure of the hind wing and the palpi place it there without doubt.

Protoptila maculata Hagen.

Clymene ægerifasciella Chambers.

This pretty species is not uncommon along the Potomac region in late summer. Chambers described it as a Tineid moth. I have seen Hagen's type at Cambridge.

Allotrichia signata, n. sp.

Antennæ yellowish; head and thorax with yellowish hairs, ocelli present: fore wings black, with yellow spots as follows: a large oblong one at pterostigma, four rather large ones at subequal distances apart on the hind margin, and several small dots near the apex; fringe black, except at the pale spots where it is of the same color; hind wings gray, with gray fringe, except the apical part of the costal which is black; on the hind margin the fringe is but little longer than width of wing; legs yellow, spurs 0-3-4, hind and middle tibiæ fringed, but the fringe not very long. The fore wings have a moderately sharp tip; the hind wings are long and narrow, with an elongate concavity along costal margin beyond middle of the wing. Length 4 mm.

One specimen from Falls Church, Va., 29th June.

Allotrichia maculata Banks.

From Falls Church, and Glencarlyn, Va., 9th September, and Washington, D. C., 25th August.

Orthotrichia pallida, n. sp.

Antennæ white, in the male rather long and heavy; head white above; thorax with white hair; fore wings with pale yellowish hair, the posterior fringe white, the anterior fringe whitish, except a black patch at pterostigmatic region; slightly beyond middle of wing, at equal distances from each margin, is a black spot, and another, less distinct, on posterior margin, basad of this one; hind wings pale, nearly hyaline, fringes nearly white. Legs yellowish, spurs 1-3-4; hind tibiæ with long white fringe. Fore wings slender, acuminate at tip, which is upturned; hind wings an-

gulate near base on costal margin, thence rapidly tapering to slender tip. Length 3 mm.

From Potomac river near the Long Bridge, 25th August.

***Orthotrichia americana* Banks.**

From Washington, latter part of May till middle of August.

***Oxyethira dorsalis*, n. sp.**

When at rest it is blackish, with a median dorsal white stripe formed by the white hairs of head, middle of thorax, the basal part of hind margin of fore wings, and the white fringe of hind margin. The antennæ are white, with a few dark spots before tip, the vertex with two rosettes of white hair; the thorax has white hair on the middle, dark on the sides; the fore wings are clothed with dark brown hair, with the apex and the basal part of radius jet black; before the middle there is a white spot on each margin, sometimes apparently connected, beyond these is a white patch in the middle of wing, and farther out are two white patches on each margin, the last just before the black upturned tip. The fringe of the fore wing is rather long on the costal margin, and before tip it is much longer than the width of the wing at that point; the fringe of hind margin is much longer, especially toward tip. The hind wings are gray, with darker veins, and dark costal fringe, the gray hind fringe more than three times as long as width of wing. The fore wings are very slender, the costal margin before the tip is slightly concave, the tip almost sharp; the hind wings are very slender, acuminate, the costal margin near base swollen. Legs yellowish; spurs 1-3-4; hind tibiæ with long fringe, the hind spurs also very long. Length 3 mm.

Many specimens from Washington, D. C., Falls Church, Va., and Plummer's Island, Md.; June to September.

This species is separated from *Orthotrichia americana*, which it superficially resembles, by the fact that the costal fringe of fore wings near tip is longer than the width of the wings at that place, while in the latter species the fringe is barely longer than elsewhere along the costal margin.

EXPLANATION OF PLATE II.

- | | |
|----------------------------------|--------------------------------------|
| 1. <i>Protophila maculata</i> . | 10. <i>Psocus bisignatus</i> . |
| 2. <i>Orthotrichia pallida</i> . | 11. <i>Cyrnus pallidus</i> . |
| 3. <i>Psocus elegans</i> . | 12. <i>Helicopsyche annulicornis</i> |
| 4. <i>Leptocerus flavus</i> . | 13. <i>Protophila maculata</i> . |
| 5. <i>Oxyethira dorsalis</i> . | 14. <i>Lepidostoma togata</i> . |
| 6. <i>Hydropsyche speciosa</i> . | 15. <i>Lepidostoma togata</i> . |
| 7. <i>Orthotrichia pallida</i> . | 16. <i>Protophila maculata</i> . |
| 8. <i>Allotrichia signata</i> . | 17. <i>Allotrichia signata</i> . |
| 9. <i>Cyrnus pallidus</i> . | 18. <i>Psocus bisignatus</i> . |

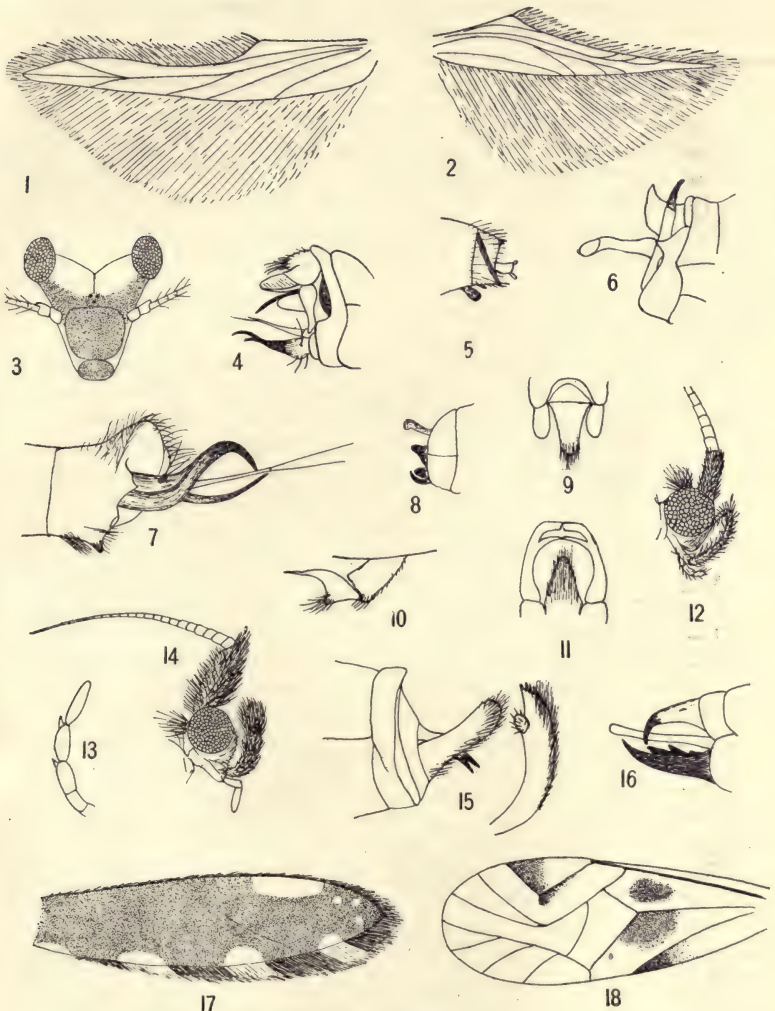


PLATE II.

NEUROPTEROID INSECTS FROM THE VICINITY OF
WASHINGTON, D. C.

—The following papers have been presented for publication :

THE EGG AND YOUNG LARVA OF CULEX PERTURBANS
WALKER.

By HARRISON G. DYAR AND ROLLA P. CURRIE.

Among the mosquitoes which have been found to occur more or less commonly on Plummer's Island, Maryland, the headquarters of the Washington Biologists' Field Club, is this large and easily recognized ring-legged species. Four adult specimens were captured there on August 23 of the past summer by one of the writers (Mr. Currie), but were not preserved alive. They were determined by Mr. D. W. Coquillett who mentioned the desirability of obtaining living examples in order, if possible, to secure eggs and larvæ therefrom.

Accordingly Mr. Currie made another trip to the island on the afternoon of August 25, remaining there till the following morning. This trip resulted in the capture, alive, of three adult ♀♀ which came to bite, one in the house about nine o'clock that evening at a lighted table and the other two on the porch about 5.30 in the morning. The first specimen, to be alluded to as "No. 1," was by mistake caught in a cyanide vial, but when recognized as *perturbans* was quickly removed. It recovered in a very few minutes and was permitted to bite, which it did without hesitation when the captor's arm was placed over the mouth of the bottle in which it was confined. Of the other two specimens, one (No. 2) was already gorged with blood when captured, and the other (No. 3) was allowed to bite the hand a few hours later, an opportunity of which it eagerly availed itself.

Each mosquito was placed in a wide-mouth bottle, one-half to two-thirds full of water, taken from a rain-water barrel in which *Culex pipiens* and associated species were breeding in numbers. The water was, of course, carefully strained before using to exclude all *pipiens* and other larvæ.

On the second of September mosquito No. 2 was resting on the surface of the water as if preparing to deposit eggs. The following morning it was still in this position, but no eggs had been laid. In the bottle with No. 3, however, and floating upon the water, was a boat-shaped mass of eggs of a pale whitish color. Very shortly the eggs began to turn dark and before noon were brown-black.

No further observations were made until September 6, at which time the eggs were still unhatched. Mosquitoes Nos. 1 and 2 were dead on the surface of the water. No eggs had been deposited by No. 2, but beside No. 1 were a few irregu-

larly-placed eggs, appearing as if they had been laid while the mosquito was in a weak or dying condition.

Eggs of No. 3 were found hatched on the morning of the 8th, and a few of those laid by No. 1 hatched the morning of the 10th. For the first few days the larvæ were fairly active and wriggled in a leisurely fashion, although seldom coming to the surface. On one occasion, a few days after their hatching, they were noticed at the surface, but when disturbed did not soon return. Some of them lived for ten days or longer, but did not pass beyond the first stage and became more and more sluggish until their death.

The egg-mass, egg and larva may be described as follows :

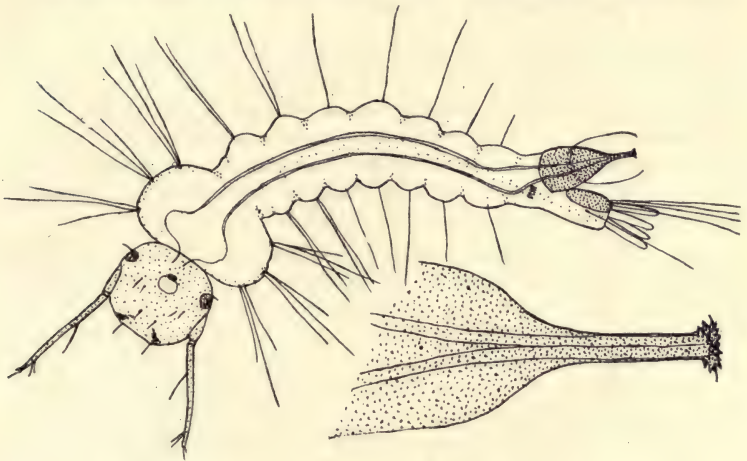


FIG. 4.—Larva of *Culex perturbans*, first stage, and enlarged air-tube.

Egg-mass.—Floating on the surface of the water, boat-shaped, somewhat pointed at one end, broad and truncated at the other, widest near the middle; * containing about 150 eggs adhering loosely together and resting perpendicularly on the water on their larger end, thus making the mass narrower above than beneath.

Egg.—Resembling that of *C. pipiens*, narrowly conical, broad and flatly rounded at the micropylar end, narrow and bluntly pointed at the other. At first pale whitish in color, afterwards becoming brown-black. Surface covered with small granules of varying size, those at the small end largest and perceptibly denticulated. Length .8 mm., greatest width .2 mm.

* It is altogether probable, of course, that different egg-masses laid by this species will be found to vary considerably, not only in shape but also in the number of eggs they contain.

Larva, stage I.—Head elliptical, a little longer than wide, smooth, a distinct offset on each side bearing the antennæ, which are very long, slender, a small hair at basal third, two smaller ones before tip and two terminal spines; two spines at the mouth; brushes very small and of few hairs; eyes round, blackish; a small black button on the center of the upper surface with a clear space before it. All darkly infuscated except the basal insertion of the antennæ, which are paler toward the tips. Thorax broader than long; abdomen submoniliform, normal. Thoracic hairs fine, not long, in groups on the sides as usual. Abdominal hairs moderate, the large lateral ones double on the first two segments, then single, less developed posteriorly. Comb of the 8th segment a single row of short, pointed spines. Air tube constricted at the outer third, the terminal portion linear and ending in a bunch of stout recurved hooks, the basal portion slightly constricted centrally, bearing a long hair on each side, but no pecten; heavily infuscated to base. Anal segment longer than wide, an elongate dorsal plate, slightly infuscated; dorsal tufts of two hairs on each side, a smaller lateral hair, no ventral brush. Anal processes four, small, very slender, uniform with rounded tips, containing small tracheæ. Body tracheæ slender, uniform, nearly straight, traceable from head to air tube distinctly. Body transparent with many small yellow spots of pigment, irregularly scattered.

This larva has hitherto escaped observation. It is the last one of the common Atlantic Coast forms to be discovered, and is really not discovered yet, since we are unaware of its natural habits and places of occurrence. The larvæ refused to feed. They did not use the small mouth brushes perceptibly, but lay at the bottom of the water absolutely motionless for hours and days together. Some specimens we thought dead; but on transferring them to a slide, they wriggled in a fairly lively manner, pushing the curiously shaped air tube as if to fasten it in some object. This tube is obviously of a prehensile nature, being furnished with hooks like the cremaster of a moth pupa. It can scarcely serve to pierce the water film; but whether the larvæ live in hollow trees and attach themselves by the air tube to the soft wood within, or whether their life history is of an even more complex nature, we can only surmise at present. They do not seem active enough to be predaceous, and they are not ordinary vegetable feeders. If they are parasites, we cannot yet surmise in what manner, nor on what host.

A NEW TORTRICID FROM THE SEA SHORE.

(Ancylis maritima, n. sp.)

By HARRISON G. DYAR.

While at Weekapaug, Rhode Island, last summer, I observed the leaves of the beach pea (*Lathyrus maritima*) to be much eaten by the larva of a small Tortricid. The leaves were spun together in pairs and the half of the leaf within eaten away to the outer epidermis, the frass being retained in the cavity. Larger leaves were folded over to form a similar cavity. The larvæ were yellowish, without marks or other distinctive characters.

The moths were bred the same season, and proved to be a species of *Ancylis* unlike any known to me, for which I propose the name *maritima*, as it seems confined to the beach pea, which grows only in the shore sand. The moths resemble *semiovana* Zeller, *lundana* Fabricius, and *laciniana* Zeller. The ground color is largely dull ochraceous, being white only at the edges of the dark markings. The basal oval dark patch has an irregularity on its upper edge which, in some specimens, is resolved into a blackish dash. The median oblique costal band is brown, often darker on the costal part, the median portion becoming faint, its shape much as in Zeller's figure of *angulifasciana*. A series of white and brown bars at apex. The hind wings are blackish, with pale fringe. Expanse of wings 10–12 mm.

The types of *Ancylis maritima* are ten bred specimens, one of which is in the collection of Mr. W. D. Kearfott, the others in the National Museum, type No. 8140.

A NEW PHYCITID FROM THE FOOTHILLS.

(Lætilia fiskeella, n. sp.)

By HARRISON G. DYAR.

Among a collection of some thirty-five species of Phycitinae, made by Mr. W. F. Fiske at Tryon, North Carolina, last summer, is one which appears to be new, and which I would describe as follows:

Lætilia fiskeella, n. sp.

Fore wings with 11 veins, 4 and 5 stalked, not in line with the median vein, 7 and 8 stalked, 8 rather weak, 10 and 11 from the cell; hind wings with 7 veins, 2 shortly before angle of cell, 3 and 4 stalked, cell rather less than half the length of the wing. Palpi slender, second joint curved, as-

ending, third joint long, conical; ♂ antennæ simple. Light gray with heavy black shades. Basal space darkly shaded to inner line, which is upright, flexuous or slightly dentate, pale, followed by a broad black shade. Discal dots small, fused into a larger spot in one specimen. Outer line bent inward slightly on the folds, with black shades on both sides, the outer covering the terminal space. Hind wings dark with pale fringes. Expanse 17 to 19 mm.

One ♂, four ♀♀, Tryon, N. C., May 12 to 21, 1904 (W. F. Fiske).

Type.—No. 8141, U. S. National Museum.

A FEW NOTES ON THE HULST COLLECTION.

By HARRISON G. DYAR.

I have recently spent a few hours in looking over the Hulst collection, and have noted some points that seem worthy of record. A full commentary on the synonymy of the Hulst types cannot be made without more extensive comparison of specimens.

The collection is now placed in a small basement room in the Rutgers College library, where it has been carefully installed by Dr. J. B. Smith. I was told that the specimens stand as Dr. Hulst left them, having been simply transferred to drawers, and that there have been practically no additions made. This is most commendable. I hope that when additions are made they will be clearly marked so that they cannot be confounded with the original collection, the specimens of which should not be transferred or replaced. The collection is smaller than I had supposed it to be and weak in the number of specimens of each species, there being no long series and most frequently only one or two specimens. It is, however, very rich in types. The specimens themselves are seldom in good condition, some of the types even being nearly unrecognizable.

But the most surprising feature is the general condition of confusion of the species. This is due to no accident, but must be attributed to the peculiarities of the founder of the collection. Dr. Hulst seems to have had absolutely no eye for specific individuality, placing the most incongruous forms under the same label. Even his types are in this condition and I believe that where he has more than one type of a species they are more often different than conspecific. For example, of the two types of *Philereme multivagata*, one is *Eustroma explanatum*. Under *Caberodes majoraria* Gn. are four specimens, one of which bears the red label "typical." The three are normal *majoraria*;

but the one selected as being especially typical is a well defined specimen of *Sabulodes caberata* Gn.! Under the label *Petrophora munitata* Hübn. are four specimens, two of which are *Rheumaptera sociata* Borkh., one *Mesoleuca lacustrata* Guen., and one *Hydriomene latirupta* Walk. Under the label *Selidosema umbrosarium* are 23 specimens, arranged in three groups as if they had been sorted into subspecies, yet there are at least six good species among them, including such heterogeneous things as *Melanolophia canadaria* and *Eucymatoge intestinata*. Nor are these isolated cases. It is now fairly evident to me how Dr. Hulst could make such atrocious determinations as he has formerly made. Indeed I wonder that, with his collection in such a condition, he could ever name anything correctly.

GEOMETRIDÆ.

Cysteopteryx viridata Pack.

The single ♀ specimen in the collection so labelled is a lightly marked *Nyctobia*.*

Eudule hyalina Hulst.

This appears to be only a badly rubbed specimen of *E. unicolor* Rob.

Tephroclystis brunneipennis Hulst.

The single type bears a label "*Nyctobia*." It is from Alameda, Cal. (Koebele) and is a large ♂ of *Percnoptilota fluviata* Hübn.

Eucymatoge grandis Hulst.

The single type is *Hydriomene basaliata* Walk. The species which I have been calling *grandis*,† following an identification made for me by Dr. Hulst, is really his *E. græfi*. Correction should be made accordingly.

Hydriomene curvilinea Hulst.

This is the same as *H. occidens* Hulst, the subbasal and outer transverse anterior lines being a little more distinct than in the type of *occidens*. The name *curvilinea* has precedence, though it is an inappropriate and even misleading one.

Hydriomene amorata Hulst.

The ♂ and ♀ types are in the collection and are the same as *Petrophora defensaria* Guen.

* See Pearsall, Can. Ent., xxxvi, p. 210, 1904, line 20.

† Proc. U. S. Nat. Mus., xxvii, p. 892, 1904.

Petrophora illocata Hulst.

There are two types, one of which is *P. glacialis* Hulst, the other *P. nemorella* Hulst. *P. glacialis* may therefore be referred to *illocata* as a synonym, or *nemorella* may be so referred as you prefer.

Mycterophora monticola Hulst.

This is a Noctuid, but thin and broad-winged. I did not recognize the species when examining the collection, but have since selected one from Placer Co., California (Koebele), which I think is the species. It is smaller than Hulst's measurement, expanding but 26 mm., but agrees otherwise. It was formerly named by Dr. Hulst "*Aspilates desperaria* Hulst."

Mycterophora longipalpata Hulst.

This species is evidently correctly placed by me.*

Mycterophora slossoniæ Hulst.

This is a large sized *Homopyralis*, but I did not venture to say what species without being able to make comparisons, and especially as the type is very poor. I think the gray costal band is an artifact.

Eois anticaria Walk.

Of two specimens so named, one from Colorado is my *Cymatophora matilda*; the other from California is like it but the lines are differently placed. There is no certainty that Hulst has correctly identified Walker's species in either specimen. *Matilda* is not an *Eois* in any case.

Sciagraphia flavivenata Hulst.

The single ♂ type looks to me like a very fresh, brightly marked *Orthofidonia exornata*, with all the wings darkened and the veins yellow-lined.

Macaria grassata Hulst.

This seems scarcely distinct from *M. aquiferaria* Walk. It is a little smaller.

Cymatophora ella Hulst.

The type is one ♀ and looks like a common *Deilinia* of the *behrensaria* group with all the markings obsolete. Bear this in mind when you think you have a new *Deilinia*.

Cymatophora festa Hulst.

The single ♀ type is *Deilinia pulveraria* Hulst. The name *festa* has priority, but should be referred to *Deilinia*.

*Proc. U. S. Nat. Mus., xxvii, p. 877, 1904.

Diastictis speciosa Hulst.

The ♀ type is a Geometrid, but associated with it as the males are two specimens of the Noctuid *Matigramma rubrosuffusa* Grote, which has a slight superficial resemblance.

Thallophegma fautaria Hulst.

This is *Anthelia nigroseriata* Pack. *Tetracis hyperborea* Hulst (type in the National Museum) is likewise the same species, which Packard figures very well. It is not a *Deilinia* as Hulst makes it,* but congeneric with *Anthelia taylorata* Hulst. The “*Deilinia nigroseriata*” of the Hulst collection is *Apæcasia deductaria* Walk., which Mr. Geo. W. Taylor has identified for me.

Deilinia perfalcata Hulst.

The two ♀ types are *Anthelia taylorata* Hulst. (See above.) I am unaware that this name has been printed except in Smith's list of 1903, No. 3915.

Caripeta ida Hulst.

One ♀ type, which I can match in a specimen from Beulah, New Mexico (T. D. A. & W. P. Cockerell). It is *Deilinia behrensaria* Hulst with the ground color reddish, the pale part of the outer line obsolete, but its outer black border continuous from costa to margin.

Somatolophia umbripennis Hulst.

The single ♀ type is *Alcis haydenata* Pack. Thus both genus and species fall.

Tornos cinctarius Hulst.

This seems entirely distinct from *scolopacinarius* Guen., perhaps even generically so. The type is a single ♀.

Ixala desperaria Hulst.

As an unusual circumstance, the type in the Hulst collection is conspecific with the one in the National Museum. This is the species which I have called (erroneously) *Deilinia quadraria* Grote.† The reader will kindly make the correction in the two references indicated. Dr. Hulst's identification of *D. quadraria* is the form which grades into *D. carnearia* Hulst and *D. bifilata* Hulst,‡ an identification which I am not in a position to dispute. *Quadraria*, then, will fall in with the *falcataria* series, the earliest name for which appears to be *ferruginosaria* Pack. Hulst uses this name (*ferruginosaria* Hulst, nec Pack-

* Bull. 52, U. S. Nat. Mus., p. 306, No. 3637, 1902.

† Psyche, ix, p. 383, 1902; Proc. U. S. Nat. Mus., xxvii, p. 904, 1904.

‡ Psyche, ix, p. 419, 1902.

ard) in *Catopyrrha*,* and I have a specimen like the one that stands in his collection under that label. It is very unlike Packard's figure of his original ♀ type of *ferruginosaria*, being even larger than *coloraria* Fab., while Packard had a small, nearly unicolorous form. It may be called **Catopyrrha hulstii**, n. sp. It resembles *Deilinia behrensaria* Hulst (and was once so determined for me by Dr. Hulst), but the two lines are upright and straight across the wing and there is a separate subterminal row of black dots.

Selidosema correllatum Hulst.

Two types, labelled "*Macaria correllatum*," are both *Sciagraphia granitata* Guen. There is a third type in the National Museum which is quite a different species, resembling *Diastictis inquinaria* Hulst, but smaller and otherwise different. There are also in another drawer two more types labelled *Selidosema correllatum*. They are not alike but may represent the species in the National Museum. My notes are not sufficient to settle the point.

Under the label *Sciagraphia granitata* Guen., Hulst had eight specimens, three normal *granitata*, three *S. denticulata* Grote, one specimen labelled as Bates' type of *sexpunctata* and one *Macaria æquiferaria* Walk. Bates' *sexpunctata*, by the way, is, to judge from this type, neither *denticulata* Grote nor *granitata* Guen., but *californiata* Pack., or a form of that type. I was unable to compare it properly.

Nacophora minima Hulst.

The single ♀ type resembles *Gabriola dyari* Taylor, but the white spot above anal angle is only a faint lighter cloud. It is probably the ♀ of *dyari*. The type is from Colorado (Bruce). Mr. Taylor's generic name will hold.

Jubarella danbyi Hulst.

One type only. It is synonymous with *Spodolepis substriaria* Hulst. Neither this nor the two types of *substriaria* possess the discal marks, though they are distinct in some of my specimens. The species flies from the Atlantic to the Pacific in the North and further south along the Rocky Mountains.

Eugonobapta brunneolineata Hulst.

One type. I think this is only a very badly rubbed specimen of *Ania limbaria* Haw., that originally had very little purple.

Euchlæna galbanaria Hulst.

This is the same as *E. falcata* Pack.

* Bull. 52, U. S. Nat. Mus., p. 317, No. 3758, 1902.

Eutrapela perangulata Hulst.

This is the same as *E. alcipheraria* Walk.

Metanema incongruaria Hulst.

This is not specifically distinct from *M. quercivoraria* Guen.

Almodes terraria Guen.

Specimens of this odd species are in the collection. Dr. Hulst* has redescribed it as *Cleora pedicellata* and *Cleora subaustralis*, the types being in the National Museum. They both have the antennæ broken, otherwise their proper position would have been too obvious for even Dr. Hulst to mistake.

PHYCITINÆ.

Dioryctria bistriatella Hulst.

The ♀ type looks like a *Myelois*; but it is distinct from *im-mundella* Hulst, which is narrower winged and different. The synonymy given by Dr. Hulst† should be cancelled.

Myelois elegantella Hulst.

The ♀ type is a synonym of *Dioryctria abietella* Schiff., not of *Pinipestis albovittella* Hulst as given.‡

Pinipestis umbripennis Hulst.

The ♂ type suggests my *Ortholepis gillettella* and may be the same species, though an actual comparison is needed. The species does not belong to *Pinipestis* as the ♂ antennæ have only the normal basal tuft.

Dioryctria brucei Hulst.

The ♂ type is the same as *Ambesa lallatalis* Hulst, which is a ♀. The species belongs neither to *Dioryctria* nor *Ambesa*, but falls in *Tacoma*. The ♂ antennæ have a distinct tuft, though it is hollow from top view. The ♀ type of *brucei* is another species which I did not stop to determine.

Salebria delectella Hulst.

The ♀ type appears to be a *Dioryctria* from the pattern of the markings.

Myelois aliculella Hulst.

There are two types and nine others, all alike. A twelfth specimen is different and is probably my *Salebria furciferella*. A mistake has been made in the generic location of *aliculella*. It cannot belong to *Myelois* as the ♂ maxillary palpi are very distinctly pencil-tufted. It may be better referred to *Salebria*.

* Bull. 52, U. S. Nat. Mus., p. 326, Nos. 3856, 3857, 1902.

† Bull. 52, U. S. Nat. Mus., p. 418, No. 4676, 1902.

‡ Bull. 52, U. S. Nat. Mus., p. 421, No. 4718, 1902.

Etiella rubribasella Hulst.

This seems only a small specimen of *E. zinckenella* Tr.

Zophodia bella Hulst.

The ♀ type from Massachusetts is the same as the ♂ type of *franconiella* Hulst from New Hampshire. There are also five specimens from Colorado which differ a little from the eastern form, being more stone color, more contrasted and a trifle narrower winged.

Euzophera inornatella Hulst.

The ♀ type is *Homæosoma stypticellum* Grote, as I have identified that form. Dr. Hulst's identification is different, but uncertain. Under the label *stypticellum* are four specimens, representing as many distinct species. One is marked "typical" (New Hampshire) and has the bands broad, discal dot large, the rest of the wing nearly white. *Inornatella* is in the wrong genus in any case.

Lætilia hulstii Cockerell.

The type is greasy and perfectly indeterminable, and is a ♀ as well. It is larger than *coccidivora* with the hind wings white. I do not believe that it is at all related to it.

Palatka nymphæella Hulst.

The type has no abdomen and no antennæ, so the sex cannot be determined. Superficially it looks exactly like the European *Heterographis oblitella* Zell.

Zophodia nigromaculella Hulst.

There are nine specimens, all ♀♀ and conspecific with *Lætilia coccidivora* Comstock. The single palpus left on the type is defectively porrected and is apparently the cause of the wrong generic reference. Dr. Hulst was fond of referring to the value of "structural characters." The present case points a moral.

Statina gaudiella Hulst.

The abdomen is gone and the sex is indeterminate. There is no tuft of scales at the base of the antennæ, though they are bent. Perhaps it is rubbed off, since the published accounts mention this character. Fore wings with 10 veins, 3-4 and 8-9-10 stalked; hind wings with 6 veins, 2 before the angle of the cell. The species looks like *Aurora longipalpella* Rag., known only in the ♀, but that has 7 veins in the hind wing. I think that we must be prepared for variations in the venation of these little tongueless Phycitines, and I shall not be surprised if *gaudiella* and *longipalpella* prove identical.

Wekiva nodosella Hulst; **Chipeta perlepidella** Hulst;
Hypsotropha luteicostella Ragonot; **Calera puncti-**
limbella Ragonot.

I am of the opinion that these four names should be united, as one species, to *Peoria approximella* Walker. The markings are identical in all. The differences on which these five genera rest are: whether the palpi are porrect or ascending; whether there are 6 or 7 veins in the hind wings and 9 or 10 in the fore wings. The palpi are movable and assume various angles after death. The under side of the second joint is straight, the upper side widened, giving the appearance of a slight downward curve. Ragonot's figure of *Hypsotropha luteicostella* shows the second joint distinctly curved upward, and this may be distinct if the figure is correct. I have no specimens referred to it. *Calera punctilimbella* Rag. differs only in having 6 veins in the hind wings. This is a case of variation, I think, as I have specimens of *approximella* with the stalk of veins 3 and 4 of various lengths, some closely approaching coalescence. Hulst's type of *Wekiva nodosella* has now no palpi. It does not otherwise differ from *approximella*. The type of *Chipeta perlepidella* is supposed to differ in having but 9 veins in the fore wings. I could not find more than this number; but the tips of both wings are so broken in the type that there is no certainty; there may really have been ten. The genus and species are due either to an error or a case of variation, I believe.

NOTES ON A FEW ARADIDÆ OCCURRING NORTH OF THE MEXICAN BOUNDARY.

By OTTO HEIDEMANN.

Calisius pallipes Stal.

Calisius pallipes Stal, Rio Hem., 1, p. 67, 1858.

Biscayne Bay, Florida, May 9, 1887 (collection Heidemann), one ♀ specimen received several years ago from Mr. E. A. Schwarz. It is of a very light brownish color, showing no fuscous spots on the scutellum. Probably the insect was not mature when captured. The species was originally described by Stal from Rio Janeiro, Brazil. Dr. G. C. Champion adds another species from Panama, Central America.

Pictinus aurivillii Bergroth.

Pictinus cinctipes, var. Bergroth, Verh. zool.-bot. Ges. Wien, p. 60, 1886.

Pictinus aurivillii Bergroth, Revue d'Entom, vi, p. 247, 1887.

Six specimens, ♂♂ and ♀♀, and some larval forms, from Crescent City, Florida (collection Heidemann). These insects were found by Mr. H. G. Hubbard on bark of dead orange trees. Also one from Bayou Sara, La. (Schwarz). The specimens agree perfectly with Dr. Bergroth's brief description in that they are distinct from the South American *P. cinctipes* Stal by having the third joint of antennæ longer than the second one. Bergroth's specimen came from Georgia.

***Proxius schwarzii*, n. sp.**

Body elongate-oval, parts of head, thorax and scutellum excavated and raised. Color reddish brown and covered in some places with a yellowish white incrustation. Head about as long as broad and formed neck-like at base; postocular part of head tumidly margined, exteriorly, bluntly

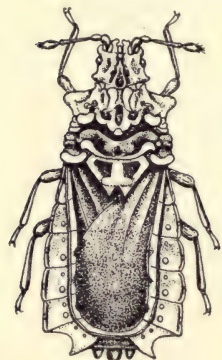


FIG. 5.—*Proxius schwarzii*, ♀

toothed, making the head broader there than in front; in the middle of the head is a longitudinal ridge, with a large hole at its broader end; on both sides of this ridge opens a long, deep excavation, extending even to the thorax, probably serving for the reception of the antennæ; next to the eyes another but more shallow excavation; tylus rounded, a little depressed, much shorter than the apical lobes of the head, which are sinuated at the sides and in front, the rounded tips converging inwardly; antenniferous process strongly spined and curved interiorly, reaching to the middle of the first antennal joint; eyes considerably small; basal joint of antennæ stout, twisted outwardly and reaching a trifle over the tip of the apical lobes of the head; second joint oval, shorter than the first; third very thin, a

little knobbed at the apex and about twice as long as the second; the terminal joint nearly as stout and long as the first, pilose at the tip. Thorax subquadrate; lateral margins anteriorly strongly sinuated and excavated in front, posteriorly more straight, rounded off in short flaps at the humeri, which carry transversely a narrow ridge. At the angles of the anterior margin of thorax is an obtuse, somewhat excavated strong spine, bending down behind the base of head; the posterior margin of thorax in the middle convexly rounded; at the disk of the thorax the incrustate part is moulded into a bilobed prominence, much elevated anteriorly, while down the middle of it runs an excavation which changes abruptly into an upright, blunt thorn, cut off at tip; the anterior and posterior lobes of the thorax are separated, a little behind the middle, by a transverse, deep furrow, bounded by a bisinuate ridge; behind this two incrustate spots. Scutellum formed somewhat shield-like; the sides thickly rimmed, more obsolete at base; the apex triangularly incised;

in the middle of the scutellum a reversed \perp -like elevation. Head and the anterior lobe of thorax remote, deeply punctured; posterior lobe and scutellum somewhat granulated. Hemelytra shining and rather transparent; the veins of the corium feebly marked; the inner margin bisinuate; base of membrane a little whitish. Abdomen one-third longer than broad; narrower at base than before the apex and with the lateral margins slightly rounded towards the end of the fifth segment, the outer angle of which appears a little prominent; the last abdominal segment at the sides deeply sinuated, the apical part exteriorly rectangular, and acute, the apex of the segment transversely truncate. Ventral part of abdomen ornamentally incrustate; connexivum from above, at the incisures of the first and fifth segments only partly so; the sixth totally, and a few spots of incrustation on the inner margin of dorsal abdomen, next to the membrane. Genital lobes, seen from above, short, triangularly rounded; the middle lobe stouter and a trifle longer. Feet moderately thickened, finely granulated, light brownish, the femora dark brown towards the tip. Length 4.5 mm.; width across abdomen 2 mm.

One specimen, a ♀. Tampa, Florida, April 27, 1875 (E. A. Schwarz).

Type.—No. 8155, U. S. National Museum.

This interesting species comes nearest to *Proxius gypsatus* Bergroth,* found in Venezuela and Central America, but differs in the form and arrangement of the incrustate prominences and in having the peculiar form of the elevation on the middle of scutellum just reversed from that of Bergroth's species. I take pleasure in dedicating it to my friend Mr. E. A. Schwarz, to whom I am indebted for kind advice in my studies of the Hemiptera.

Aradus uniformis, n. sp.

Body uniformly broad, comparatively short and very thin; color dull black, except the third joint of antennæ and the edges of the abdominal segments adjoining the incisures of the connexivum above and below, which are yellowish white. Head, pronotum, and hemelytra more or less granulated in transverse rows, more strongly so on the lower part of scutellum and finely and irregularly on the underside of the body. Head somewhat longer than broad across the eyes; the apical process of head long and straight, reaching the second joint of antennæ, the sides broad and compressed, the tip bluntly rounded off; antenniferous process of head prominent and very acute, reaching to the middle of the first antennal joint; eyes moderately large, strongly protruding from the sides of the head. Antennæ about as long as the width of the posterior margin of pronotum, densely covered with fine granules and rather thick, the basal

* Entom. Monthl. Mag., xxxiv, p. 100, 1898.

Proxius gypsatus Bergr. (Champion), Biol. C.-Am. II, p. 70, 1898.

joint thinner, cylindrical, and very short; second joint quite thin at the base, gradually increasing in thickness towards the tip, its length somewhat exceeding the two last joints taken together; third joint slightly longer than the terminal joint, which is fusiform. Rostrum not extending over the anterior coxæ. Pronotum wide, sublunate and twice as wide as long in the middle, the lateral margins anteriorly recurved, the edges beset with minute teeth of which a few are larger at the anterior sides; posterior margin barely sinuated, behind the humeri not produced into rounded flaps; the disk of pronotum carries six longitudinal well defined carinate lines at equal distances, the outer ones much abbreviated, but the middle lines even touching the edge of the anterior margin; the callosities only feebly marked. Scutellum twice as long as broad, the sides sharply elevated, at the middle slightly sinuate, and the disk tumidly raised near the base of scutellum. Hemelytra comparatively long, tip of corium reaching the posterior part of the fourth abdominal segment; the costal margin moderately expanded, anteriorly recurved and not strongly rounded; the membrane extending to the end of the abdomen in the male; in the female the genital lobes are exposed. Legs finely granulated, the inner sides of tibiæ densely spinous. Genital lobes of the male broadly rounded, somewhat truncate at apex; in the female these apical lobes feebly sinuate, abruptly rounded towards the inner margins. Length 4 to 5 mm.; width 2 to 2.2 mm.

Two ♀♀ and one ♂. Ft. Monroe, Va., April 19, 1891 (E. A. Schwarz); Chicopee, Mass., June 25, 1903 (F. Knab); Patten, Pa., June 14, 1903 (Wirtner, O. S. B.).

Type.—No. 8153, U. S. National Museum.

This species bears some resemblance to *Aradus lugubris* Fall., principally in the antennæ, which are of nearly the same shape, although slightly thicker. But it differs from the latter in being a more robust and broader insect and in not having the lateral margins of pronotum sinuate.

Aradus hubbardi, n. sp.

Body elongate-oval; color dark brown and partly cinnamon-brown; in general appearance similar to *A. similis* Say. Head one-third longer than its width across the eyes, finely granulated; anterior process of head straight, rounded off at tip, reaching about one-third the length of the second antennal joint; antenniferous spines broad at base, very sharply pointed, extending to the tip of the basal joint, at the sides a small tooth exteriorly. Antennæ of nearly uniform thickness throughout, as long as head and thorax together; first joint very short, second quite as long as the head; third about half the length of the second, yellowish at apex; fourth a little shorter than the third, conical and blackish. Rostrum brown, the two last joints darker, extending to the middle of the mesosternum. (In one specimen before me the rostrum reaches the middle coxæ.) Pronotum half as long as broad, the anterior margin hardly sinuated, the posterior more strongly so. Lateral margins anteriorly straight, reflexed

and forming sharp anterior angles beyond the eyes; posteriorly abruptly rounding into flaps, which are, in clear specimens, of a strikingly paler color than the other part of pronotum; the edges armed with irregular teeth, which suddenly change into diminutive ones near the humeri; disk of pronotum carrying the usual six longitudinal carinate lines, the inner ones nearing each other, the outer ones much abbreviated; the callosities very feebly defined. Scutellum tumidly elevated across the middle near the base, the sides slightly rounded and sharply edged, and pale at tip. Hemelytra moderately expanded near the base and narrowing considerably towards the membrane; corium pale, darker between the cross-veins and blackish at base and apex. Abdomen of the female elongately-rounded, cinnamon-brown above and below, the outer margin of the connexivum darker, at the incisures pale, intermixed with patches of small red spots; the male has the abdomen more broadly rounded and darker in color, except the ventral part of the last two segments, which are pale. The membrane reaches the fifth or base of the sixth abdominal segment; in the male the membrane extends to the end of the abdomen. Feet finely granulated and dark brown, the coxæ and the tip of femora and tibiæ paler. First genital segment of the female nearly half as long as the sixth abdominal segment; genital lobes broad, truncate at apex, the inner part pale. In the male there is across the middle of the sixth segment of the abdomen a narrow, reddish stripe. Length, ♀ 7 to 8.5 mm., ♂ 6 to 6.8 mm.; width across abdomen, ♀ 3 to 3.8 mm., ♂ 2.8 to 3 mm.

Eight ♀♀ and six ♂♂. Portland, Ore., May 22; Astoria, Ore., May 25, 1902; Alta, Utah, July 1 (Schwarz and Hubbard); Ouray, Col. (Hoff); Palmer Lake, Co. Drinkwater (Ball); Williams, Ariz., May 30 (Barber and Schwarz); National Park, Wyo., August 10 (Hubbard); Glacier, B. C., October 6 (Schwarz).

Type.—No. 8154, U. S. National Museum.

This species ought to be placed next to *A. similis* Say, with which it has the most resemblance. It differs from that species, however, in the form of the thorax and especially in the shape of the female genital lobes. *A. similis* Say has the sides of the thorax more or less rounded, the surface flat, with the callosities prominent, and the female genital lobes decidedly emarginated. *A. hubbardi* is also related to *A. debilis* Uhl., from which it can be at once distinguished by the shorter and thicker antennæ and in having the abdomen of the female less narrowed towards the apex.

I have named this species in honor of the late Mr. H. G. Hubbard, the eminent American entomologist, who has made valuable observations on the habits and life history of hemipterous insects, and by his extensive collections has added greatly to our knowledge of the Hemiptera fauna of the United States.

NOTES ON NORTH AMERICAN PSYLLIDÆ.

PART I.

By E. A. SCHWARZ.

[The following series of descriptions was included in a Synopsis of the North American Psyllidæ prepared by myself, at the request of the late Dr. C. V. Riley, in the years 1886 and 1887, but which has never been published. With the accumulation of material collected of late years in various parts of the United States and now preserved in the collections of the U. S. Department of Agriculture and the U. S. National Museum, the Synopsis has become greatly antiquated, but it is my intention to revise and publish certain portions thereof, as well as to rescue from oblivion some fine drawings made for the Synopsis by the late Dr. Geo. Marx. This is done by the kind permission of Dr. L. O. Howard, Chief of the Bureau of Entomology, U. S. Department of Agriculture.]

I. NORTH AMERICAN SPECIES OF THE GENUS EUPHYLLURA
FÆRSTER.

This genus belongs to the subfamily Aphalarinæ Fr. Læw, and is very readily recognizable. The head has, in front of the anterior ocellus, two transverse lobes which are as wide as the vertex, contiguous throughout and, at their anterior edge, either conjointly truncate or slightly rounded separately. They are either connate with the vertex or more or less indistinctly separated therefrom. The anterior ocellus appears, therefore, to be remote from the anterior margin of the head, and is visible only from above. The anterior wings are of rhomboidal form, *i. e.*, suddenly widening at base, thence nearly parallel, apex not regularly rounded; tip of wing, therefore, close to the anterior margin. Genital plate of male without lateral appendages.

This genus contains a few European species; in North America it seems to be confined to the Pacific slope. Our species may be distinguished as follows:

TABLE OF SPECIES.

Vertex flat; frontal lobes almost connate with vertex; wings entirely coriaceous; radius and 3d and 4th furcals straight or nearly so; 2d marginal cell triangular.

Wings entirely brownish red, or with obsolete whitish spots, or with transverse white fascia; veins and sculpture of wings distinct,

arctostaphyli, n. sp.

Wings entirely snow-white or cream-white; veins and sculpture of wings indistinct..... ..var. *niveipennis*, n. var.

Vertex a little convex anteriorly, frontal lobes narrow and more distinctly separated from the vertex; wings submembranaceous at apical half; radius and 3d and 4th furcals greatly undulated, 2d marginal cell reniform..... ..*arbuti*, n. sp.

Euphyllura arctostaphyli, n. sp.

Length 2.4-2.8 mm. Head and thorax reddish brown, or brownish red, or brownish yellow, abdomen blood-red, femora honey-yellow, tibiae reddish, wings dark brown, or reddish brown, either uniformly so, or more or less maculated with whitish, or with a transverse white fascia at basal third. Subopaque, not pubescent; head strongly obliquely deflexed, more or less distinctly rugoso-punctate; vertex posteriorly nearly straight, arcuately narrowed each side at insertion of antennæ, anterior margin straight, and even not sinuate at the ocellus, at middle hardly as long as half its width at base, surface flat, discal impressions punctiform, moderately deep; genæ prominent in front of eyes causing the vertex to appear dentate each side; frontal lobes not, or very indistinctly separated from the vertex, nearly half as long as the latter, contiguous throughout, not narrowed apically, rounded at the sides, at anterior margin conjointly nearly truncate, or separately feebly rounded; eyes moderately convex, not globose; antennæ a little shorter than head and thorax together, nearly filiform, basal joints reddish, intermediate joints pale, terminal joints usually blackish and very little thicker, third joint fully one-third longer than the fourth.

Surface of thorax finely and densely punctulate, but the sculpture is often obsolete; pronotum and dorsulum strongly ascending posteriorly, the former comparatively long with the posterior edge slightly emarginate; dorsulum small, but little longer than pronotum and nearly three times wider than long; mesonotum hardly descending posteriorly, distinctly longer than dorsulum, without distinct markings.

Wings about $2\frac{1}{4}$ times longer than wide, suddenly widened at base, then parallel, the apex suddenly and narrowly rounded near anterior costa, then obliquely arched and gradually merging into the posterior costa; opaque, leathery, with fine, sparse transverse rugæ and still more finely rugulose between the rugæ; costa sinuate at outer portion of anterior basal cell and slightly indented at terminus of first furcal; veins moderately prominent, becoming finer apically; cubitus a little longer than

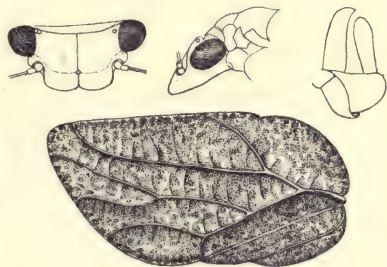


FIG. 6.—*Euphyllura arctostaphyli*.

discoidal part of subcosta, radial part of subcosta very fine and often obsolete at terminus; no distinct pterostigma; radius straight and only curved at tip, running into the anterior costa; stem of first fork as long as cubitus, stem of second fork twice longer than that of the first, straight and parallel with radius; first furcal twice shorter than the stem, terminating rectangularly on the costa, second furcal very long, three times longer than the first, forming a right angle therewith, gently curved at outer half and ending very obliquely on the costa, third furcal a little shorter than the second, slightly undulated; fourth furcal longer than the second or third, nearly straight and as long as the stem of second fork; tip of wing half way between radius and fourth furcal; radial cell very high; marginal cells large and of nearly equal size, though quite different in shape.

♂.—Genital plate very tall, much longer than the genital segment, without lateral appendages, front edge slightly convex, hind edge slightly sinuate near tip which is subtruncate, with the posterior angle acute and projecting posteriorly; forceps a little lower than the plate, simple, slightly widening from base to near the tip which is rounded, front and hind margins straight.

♀.—Genital segment as long as the three preceding ventral segments together, upper plate gently narrowed posteriorly into a moderately long acute, straight point; lower plate a little wider and shorter than the upper one, lower edge ascending, tip short acute.

Described from numerous specimens collected by Mr. A. Koebele in Placer county, Cal., on *Arctostaphylos pungens*, during the months of September and October, and at Marble Valley, Cal., in the middle of July. The specimens from the latter locality are a little darker than those from Placer county. It occurs also in the mountains of southern Arizona (Hubbard and Schwarz).

Type.—No. 8143, U. S. National Museum.

Besides the variations in the color of head, thorax and wings referred to above, a remarkable variety occurs in California which may be readily mistaken for a different species and which, for this reason, deserves especial mention and a distinct varietal name.

Var. *niveipennis*, n. var.

Color of head and thorax just as variable as in the form described above, usually pinkish red, or brownish yellow, or brownish red, thorax usually a little darker, surface of head and thorax often a little shining, sculpture usually less evident. Wings snow-white, the posterior costa sometimes margined with red or tessellated with minute red spots, surface having the appearance of being covered with fine white powder, which causes the venation to be less distinct than in the typical form and the sculpture to become obsolete. The situation of the costa in anterior basal cell is absent; abdomen and legs uniformly yellow. Sexual characters as in the typical form.

Found by Mr. Koebele in large numbers in company with the typical form, and also in Los Angeles county, Cal. Three specimens from the latter locality, collected in May, are without the white powder-like substance on the wings and the transverse rugæ are as plain as in the typical form.

Type.—No. 8144, U. S. National Museum.

***Euphyllura arbuti*, n. sp.**

Length 2.6 mm. Above yellowish red, sometimes with a tinge of brown, genital segment, underside and legs honey-yellow, wings bicolorous. Head large, strongly obliquely deflexed, more or less shining, finely rugose, posterior edge slightly emarginate, vertex at middle slightly shorter than half its width at base, posterior part flat, genæ prominent, discal impressions deep, subtransverse, smooth at bottom, vertex in front of them distinctly convex, causing the frontal lobes to appear to be depressed below the level of the vertex and to be separated therefrom; frontal lobes usually pale yellow, a little shorter than in the preceding species, antennæ a little longer than in the preceding, pale yellow, dusky at tip.

Surface of thorax subopaque, finely and obsoletely alutaceous, without distinct markings, middle of dorsulum and mesonotum usually darker; pronotum strongly ascending, lateral impressions very conspicuous; dorsulum also strongly ascending, larger than in the preceding, front and hind margins equally arched; mesonotum at middle slightly convex longitudinally.

Wings less suddenly widened at base, a little more rounded at apex, and therefore less rhomboidal than in the preceding; surface very little shining, transversely rugose between the veins, rugæ and interstices finely rugose, radial cell, the larger portion of discoidal cell, posterior basal cell and clavus pale yellow and tolerably transparent, the rest of the wing brown and hardly transparent. At the apical portion of the wing the two colors are not sharply divided. Cubitus a little longer than discoidal part of subcosta, both strongly prominent, straight, radial part of subcosta as long as discoidal part and becoming nearly obsolete at apex; no pterostigma; radius fine, strongly undulated and running into anterior costa; stem of first fork shorter than the cubitus, stem of second fork as long as cubitus; first furcal extremely short, terminating nearly perpendicularly upon the costa, second furcal three or four times longer than the first, gently curved and terminating obliquely upon the costa, third and fourth

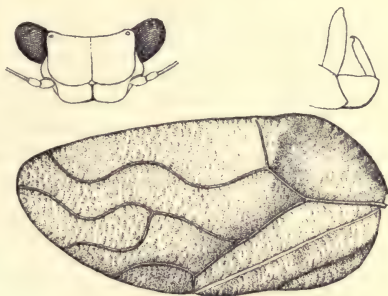


FIG 7.—*Euphyllura arbuti*.

furcals extremely long, the former forming a right angle with the stem, straight for about one-third its length then suddenly bent and slightly undulated near terminus, fourth furcal longer than the third and also longer than the stem, strongly undulated; tip of wing between radius and fourth furcal; second marginal cell reniform in outline and much larger than the first which is $2\frac{1}{2}$ times longer than high.

♂.—Genital plate longer than the genital segment, simple, moderately wide, anterior edge nearly straight, tip very narrowly rounded, posterior edge slightly convex; forceps narrower and nearly one-third lower than the plate, posterior edge straight, anterior edge also straight but near the tip suddenly sinuated, tip appearing as a minute blackish hook which points forward.

♀.—Genital segment longer than in *E. arctostaphyli*, upper plate very gradually narrowed into a straight, moderately acute point; lower plate hardly wider but decidedly shorter than the upper one, gradually narrowed into an acute point, lower edge gently ascending.

Described from several specimens collected during the months of July and August by Mr. A. Koebele in Santa Cruz county, Cal., on *Arbutus menziesii*.

Easily distinguished from the preceding by the shorter frontal lobes, the anteriorly convex vertex, the form of the wing, the venation and by the sexual characters.

Type.—No. 8145, U. S. National Museum.

2. DESCRIPTION OF THE NEST-CONSTRUCTING PSYLLID.

(*Euphalerus*, n. gen.; *nidifex*, n. sp.)

At a previous place in this volume (pp. 153-154) a short characterization (accompanied by a figure), will be found of the peculiar habit of the larva of this Psyllid, and the following lines are copied from a description of the perfect insect drawn up by myself in 1887:

Euphalerus, n. gen. (subfamily Aphalarinæ).

Body glabrous, stouter than in *Psyllopsis* or *Aphalara* but much less so than in *Euphyllura*. Head deflexed vertically or nearly so, vertex slightly emarginate posteriorly, not narrowed at the sides, at middle half as long as its width at base, anteriorly slightly obliquely truncate each side of median line; frontal cones present, triangular, contiguous at base, slightly diverging apically, not depressed below the level of the vertex and separated therefrom only by a finely impressed line; antennæ very thin but less slender than in *Psyllopsis*, slightly clavate at tip.

Surface of thorax very convex longitudinally; pronotum nearly vertical, dorsulum strongly ascending posteriorly, mesonotum longitudinally convex posteriorly. The transverse convexity of the parts of the thorax is also greater than in *Psyllopsis*.

Wings membranaceous, oblong-oval, subhyaline, shining, smooth, toward the apex with sparse shallow impressed points, gently widening at base, then of nearly equal width, regularly rounded at apex, tip between radius and fourth furcal close to the latter; veins very prominent, cubitus a little shorter than discoidal part of subcosta, a distinct, moderately long pterostigma, radius nearly straight throughout; stem of second fork curved and not parallel with radius, second furcal much longer than any of the other furcals; first marginal cell much larger than the second. Genital parts of male without appendages or lobes, genital plates of female simple.

Agrees with *Psyllopsis* in the presence of frontal cones, but differs by the much greater deflexion of the head, with the frontal cones not depressed below the level of the vertex, the shorter antennæ, the greater convexity of the thoracic surface, the venation and by the sexual characters.

Euphalerus nidifex, n. sp.

Length 2 mm. Color pale ochre-yellow varying to greenish yellow or reddish yellow, head, thorax, wings and legs speckled with minute black or brown dots, wings slightly whitish. Surface opaque, impunctate, vertex of the form described above, surface flat, discal impressions nearly obsolete, frontal cones nearly as long as the vertex, very little diverging, not acute at tip; antennæ not reaching to the posterior margin of mesonotum, pale yellow, tips of intermediate joints and terminal joints black, 3d. joint one-fourth longer than the 4th, 9th and 10th small and forming a distinct club.

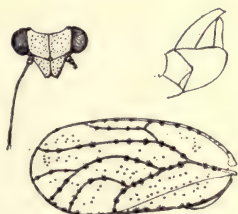


FIG. 8.—*Euphalerus nidifex*.

Dorsulum more than twice wider than long at middle, front and hind margins nearly equally rounded; mesonotum barely as long as dorsulum, decidedly descending posteriorly, convex transversely.

Wings gently widening at base, thence remaining of nearly equal width, $2\frac{1}{4}$ times longer than wide, regularly rounded at apex, slightly whitish, transparent, not rugose, but the small black dots are impressed at the outer part of the wing; veins strong, pretty regularly tessellated with brown dots; stigma moderately long, narrow and not different in coloration; radius straight and only at terminus slightly curved anteriorly; stem of second fork nearly twice longer than that of the first fork; first furcal as long as cubitus, terminating obliquely on the costa, second furcal twice longer, nearly straight at basal half, then suddenly curved and terminating obliquely on the costa, third and fourth furcals of equal length, each about one-third longer than the first; first marginal cell quadrangular rather than triangular and much larger than second marginal cell; tip of wing close to fourth furcal within discoidal cell.

♂.—Genital plate longer than the genital segment, simple, gradually narrowing apically, front margin convex, posterior margin concave, tip subtruncate and pointing posteriorly; forceps distinctly lower and much narrower than the plate, straight, hardly narrowing apically, tip subacute, black.

♀.—Genital segment about as long as the three preceding ventral segments together, upper plate higher than the lower plate, gradually narrowing posteriorly and produced in a long, straight and acute point; lower plate distinctly shorter than the upper plate, gradually narrowing posteriorly and acute at the tip which points upwards.

Originally found by myself on the Island of Key West, Fla., in April, 1887, but subsequently (in 1903) bred in great numbers from larval cases found at the same place and at Cayamas, Cuba, on the leaves and young shoots of *Piscidia erythrina*.

Type.—No. 8146, U. S. National Museum.

3. THE SUMAC PSYLLIDÆ OF THE UNITED STATES.

(GENUS *Calophya* Fr. Læw, subfamily Psyllinæ.)

This genus, founded upon a single European species, is easily recognizable by the peculiar formation of the head; the vertex is, at its anteriorly half, longitudinally convex, and therefore anteriorly inverted; the frontal cones or lobes which are of varying length but always shorter than the vertex, thus appear to be inserted on the underside of the head and they form a distinct angle with the vertex. Anterior ocellus not or barely visible from above. Antennæ short and stout, at most as long as the width of the head. Wings of varying shape, either smooth or indistinctly sculptured, transparent or opaque; cubitus very short, pterostigma present, long but narrow, first marginal cell decidedly larger than the second; genital plate of male more or less oval in outline.

The species are of small, rather stout form and live, so far as known, exclusively on various species of *Rhus* (sumac). Our eastern species hibernate as full-grown larvæ or pupæ on the stems of their food-plants, and there is but one generation each year.*

*The development of the two species occurring near Washington, D. C., was carefully studied by Mr. Theo. Pergande many years ago, and some fine drawings illustrating the various stages were made by Dr. Marx. For some reason unknown to me the box containing most of the type specimens of our species of *Calopsylla*, as well as the drawings and the manuscript referring to the descriptions of the earlier stages, could not be found after the death of Dr. C. V. Riley. Such of the figures as are still in my care are herewith published without further comment.

TABLE OF SPECIES.

Wings rounded at tip; pterostigma long and very distinct.

Wings hyaline, shining; vertex and thorax black or brown; frontal cones decidedly longer than wide, coniform, acute at tip,

californica, n. sp.

Wings yellowish, transparent, moderately shining; color of body uniformly honey-yellow; frontal cones distinctly cone-shaped, longer than wide..... *flavida*, n. sp.

Wings black, not transparent, very little shining, vertex black, thorax orange-yellow; frontal processes as long as wide or broader than long..... *nigripennis* Riley

Wings distinctly angulate at tip, hyaline, with a large brown patch at basal half of anterior basal cell; vertex and thorax brown, frontal processes transverse, very short, pterostigma short and indistinct,

triozomima, n. sp.

The color of our species appears to be more constant than in most other Psyllids, so that it can safely be relied upon for the distinction of the species; immature specimens of *nigripennis* can readily be distinguished from *flavida* and *californica* by the form of the frontal cones.

Calophya triozomima, n. sp.

Average length 1.9 mm. Vertex and thorax reddish brown, frontal lobes, abdomen and legs pale yellow (bright green in living specimens). Vertex smooth or obsoletely alutaceous, shining, discal impressions very large, transverse, frontal lobes reddish or reddish yellow, not, or barely visible from above, very short, transverse, broadly rounded anteriorly; antennæ stout, distinctly shorter than the width of the head, distinctly clavate, apparently 8-jointed, either uniformly pale yellow or slightly infusate at tip. Surface of thorax lighter or darker reddish brown, more or less shining, smooth or obsoletely alutaceous.

Wings about $2\frac{1}{3}$ times longer than wide, widest at middle, distinctly acuminate and angulate at tip, smooth, perfectly transparent and colorless excepting a larger or smaller brown spot at the basal portion of anterior basal cell. Veins prominent, pale yellow, base of subcosta frequently blood-red; cubitus extremely short, fully 3 times shorter than discoidal part of subcosta, pterostigma but little conspicuous, very narrow but traceable to about the middle of radial cell, radius straight, stem of first fork as long as discoidal part of subcosta, stem of second fork more than three times longer than that of the first, greatly curved; first furcal as long as the stem, a little curved before the terminus and ending perpendicularly on the costa; second furcal more than twice longer than the first and forming a right angle therewith, at basal third straight and running toward the stem of second fork, then suddenly and nearly angularly bent and running straight toward the costa which it reaches under an oblique

angle, third furcal distinctly shorter than the fourth which is about as long as the first; tip of wing at the fourth furcal or close to it within second marginal cell; anterior basal cell as long as radial cell, discoidal cell very narrow at basal half, rapidly widening toward apex, cubital cell somewhat reniform in outline; first marginal cell nearly quadrangular, much higher than wide and at least three times larger than the second.

♂.—Genital plate longer than the genital segment, about $2\frac{1}{2}$ times higher than broad, front and hind margins convex, tip very narrowly rounded, nearly acuminate; forceps about three times narrower than the plate and one-third shorter, very slightly curved forward, not narrowing apically, tip rounded.

♀.—Genital segment nearly as long as the rest of the abdomen, upper plate rapidly narrowing posteriorly and produced into a rather long, very acute point, upper edge rapidly descending toward the point which is straight; lower plate considerably shorter and less acute at tip than the upper plate; its lower edge nearly straight, gently ascending.

I have seen a number of specimens, partly collected by Mr.

H. K. Morrison in southern Arizona or Sonora, and partly by Mr. Coquillett in Los Angeles Co., Cal. Subsequently many specimens were found on *Rhus trilobata* in the mountains of southern Arizona by Mr. H. G. Hubbard and myself in the months of June and July.

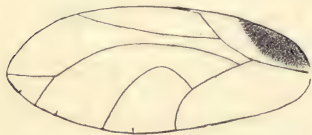


FIG. 9.—*Calophya triozomima*.

Readily known from the other species by the form of the wings, the indistinct pterostigma and the coloration.

Type.—No. 8149, U. S. National Museum.

***Calophya californica*, n. sp.**

Length 1.8 mm. Vertex and thorax piceous or brownish, abdomen (excepting genital segment and anterior dorsal segments) and underside blackish; frontal cones whitish, antennæ pale yellow except at tip, legs pale yellow, femora usually with a black spot on the inner and outer sides near the tip. Vertex as in the preceding species, frontal processes decidedly cone-shaped, longer than wide at base, more or less diverging toward the tips which are rather acute; antennæ a little thinner and more slender than in the preceding, hardly as long as the width of the head, at tip decidedly black.

Wings oblong-oval, $2\frac{1}{3}$ times longer than wide, greatest width at apical third, tip rounded, though not broadly, nearly hyaline with a tinge of milky-white, uniform in color; veins rather fine, pale yellow, differing in the following points from those of *C. triozomima*; cubitus a little longer and only $2\frac{1}{4}$ times shorter than discoidal part of subcosta; a very distinct and long pterostigma which is as long or longer than anterior basal cell; first furcal a little more curved, second furcal forming a slightly oblique

angle with the first, third furcal very little shorter than the fourth which runs into the tip of the wing; second marginal cell higher and larger; marginal veinlets distinct.

♂.—Genital segment pale yellow, sometimes infuscated at base, plate much larger than the segment, more broadly oval than in the preceding, with the tip more acuminate and usually blackish; forceps much lower than the plate, narrow, simple, gently curved forward, tip subacute.

♀.—Genital segment pale yellow, brownish toward tip, as long as the three preceding ventral segments together; upper plate gradually drawn out into a very acute but not very long point, upper edge straight, gradually sloping toward the tip; lower plate somewhat shorter and less acute at tip than the upper one, lower edge straight.

Numerous specimens collected by Mr. Koebele in Los Angeles Co., Cal., on *Rhus integrifolia* in the month of March. I have also seen several immature specimens from the same locality collected by Mr. D. W. Coquillett.

Type.—No. 8147, U. S. National Museum.

***Calophya flavida*, n. sp.**

Average length 2 mm. Color uniformly honey-yellow, legs and antennæ paler, thorax sometimes with ill-defined markings of a pale brown color and of the usual pattern. Head and thorax smooth, shining, vertex a little longer than in the following species, discal impressions variable in size, sometimes punctiform, sometimes foveiform and occupying nearly the whole width of the vertex; frontal processes distinctly cone-shaped, a little longer than wide at base, diverging toward the tip which is moderately acute; antennæ distinctly shorter than the width of the head, stout, indistinctly darker at tip.

Wings more elongate than in the preceding species, $2\frac{1}{3}$ times longer than wide, widest beyond the middle, regularly rounded at tip, pale yellow, but little shining, tolerably transparent, absolutely punctulate; veins prominent, cubitus fully 3 times shorter than discoidal part of subcosta; stigma narrow but distinct and as long as anterior basal cell, radius straight; stem of second fork less curved than in the preceding; first furcal but slightly shorter than the stem, slightly curved, terminating rectangularly upon the costa; second furcal about $2\frac{1}{2}$ times longer than the fourth, forming an oblique angle with the first, at basal third straight and not running toward the stem of second fork, at middle decidedly but not abruptly curved and terminating obliquely upon the costa; third furcal but little shorter than the fourth which is about equal in length to the first and runs in the tip of the wing; cubital cell much less narrowed at middle than in the preceding; first marginal cell triangular rather than quadrangular, but little higher than wide and about twice larger than second marginal cell; marginal veinlets rather obsolete.

♂.—Genital plate longer but not much larger than the genital segment, oblong-oval in shape, narrower than in the preceding species; forceps

nearly twice shorter and 3 times narrower than the plate, curved forward, tip acute, black.

♀.—Genital segment but little longer than the preceding ventral seg-

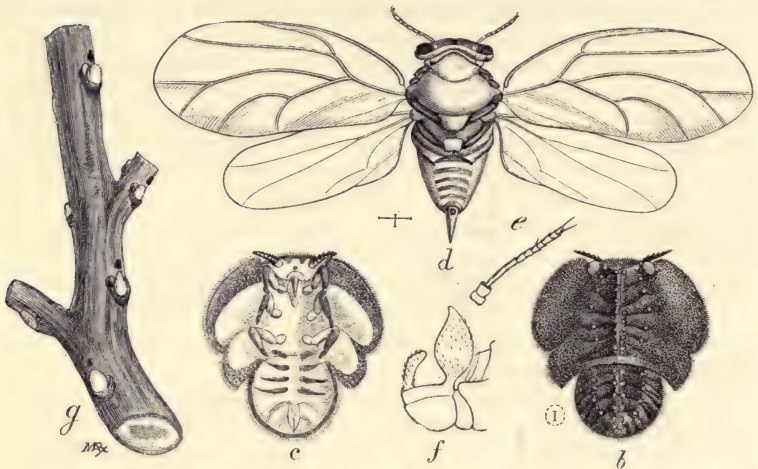


FIG. 10.—*Calophya flavida*: *b*, pupa, dorsal view; *c*, same, ventral view; *d*, ♀ imago; *e*, antenna of same; *f*, genital segment of ♂; *g*, stem of sumac with hibernating larvæ.

ment, upper plate gradually narrowed posteriorly into a short point; lower plate hardly shorter than the upper one.

This species lives exclusively on *Rhus glabra* and seems to be widely distributed; specimens are before me from Massachusetts, Washington, D. C. (collected in May), and from St. Louis, Mo.

Type.—No. 8148, U. S. National Museum.

***Calophya nigripennis* Riley** (*rhois* Glover, nec Fr. Loew).

Length 2 mm. Vertex, wings, and four anterior femora black, abdomen more or less infusate, frontal processes and thorax bright orange-yellow or sulphur-yellow, antennæ, except at tip, posterior femora and all tibiæ pale yellow. Head usually shining and impunctate, sometimes less or not shining and finely alutaceous; vertex distinctly shorter than in *flavipennis*, more suddenly rounded anteriorly, discal impressions small or large, frontal processes shorter than in *flavida*, cone-shaped, as long as wide at base or even a little shorter, more or less strongly divergent, obtusely pointed at tip; antennæ as in *flavida* but the tip is always decidedly black even in immature specimens.

Thorax unicolorous, rarely with faint traces of darker markings, sometimes shining and nearly smooth, sometimes hardly shining and transversely strigose.

Wings a little narrower than in *flavida* and at tip more narrowly rounded, entirely black, very little shining, not transparent, more or less distinctly punctulate; venation very similar to that in *flavida*, but the first and second furcals are decidedly shorter, the latter more gently curved, third and fourth furcals also shorter; the marginal cells are smaller, the first almost wider than high and about twice as large as the second.

♂.—Genital plate still narrower than in *flavida*, oblong, its posterior

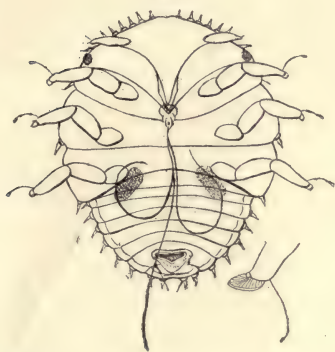


FIG. 11.—*Calophya nigripennis*: first larval stage.

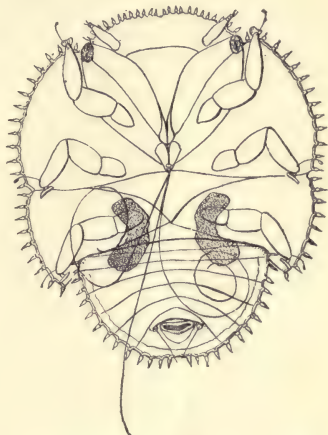


FIG. 12.—*Calophya nigripennis*: second larval stage.

edge nearly straight, anterior edge convex, tip obtusely pointed; forceps as in *flavida*.

♀.—Genital segment as in *flavida* but always more or less infusate.

Lives exclusively on *Rhus copallina*. Numerous specimens are before me from Washington, D. C. (collected in May) and various parts of Georgia (collected by myself in April).

Immature specimens resemble *C. flavida* but may be distinguished by the shorter vertex, shorter frontal cones, the sexual characters of the male and by slight differences in the venation.

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ERRATA ET CORRIGENDA.

Page 13, line 5 from bottom, for 1892 read 1902.

14, line 4, for 1892 read 1902.

40, line 17, for magin read margin.

22, lines 6 and 15, for *Leonina* read *Leonidia*.

28, line 19 from bottom, for *Ceutophilus* read *Ceuthophilus*.

31, line 13, for Findley read Findlay.

49, line 13 from bottom, for *hemisphericum* read *hemisphæricum*.

52, line 7, for Welsh read Welch.

59, line 10, after New insert York.

81, last line, for eighty-six read eighty-seven.

89, line 8 from bottom, after Kaslo, insert 30 May (Dyar) 1 specimen.

101, line 9 from bottom, for **Acanthosmiades** read **Acanthosmioides**.





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